The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Increased Speed of Machinery in Factories.

The speed of cotton machinery in Lowell is said to have been increased 30 per cent. within 12 or 15 years. If the city contained no more spindles in 1883 than in 1873, therefore, the production of the mills would still be largely enhanced. In considering the condition of various manufacturing interests this matter of higher speed and increased capacity of machinery is, says the *Commercial Bulletin*, often lost sight of, but is certainly worthy of attention in seasons of overproduction like the past six months. There are about 12,000,000 cotton spindles in the United States to-day, against 7,000,000 in 1870, but if the speed and capacity per spindle has increased even 25 per cent., the actual productive capacity of the mills has been more than doubled. And not only has the cotton manufacturing capacity of the United States been more than doubled since 1870, but a glance at the amount of cotton actually consumed by our mills shows an almost equal increase. In the three years 1869, 1870 and 1871 there were consumed in the United States 3,219,000 bales of cotton, or an average of 1,073,000 bales per annum. For the 10 months from September 1, 1882, to July 1, 1883, there have been taken for consumption by the spinners of this country 1,988,417 bales of cotton. Very moderate purchases during the next two months will bring the total up to 2,146,000 bales, or just twice as much cotton as was used in the United States in 1870.

In the woolen manufacturing interest very similar conditions are found to exist. A desire to diminish the cost of production has led to an increase in the speed of machinery, and an increase of the capacity of the mills in other directions. The loom which formerly ran 50 or 60 picks per minute now runs 95, perhaps: and where 40-inch cards were used, many mills now have cards 60 inches in width and of proportionately increased diameters. And yet, in speaking of the number of sets of woolen machinery in the United States, we are accustomed to compare the figures of 1883 with those of 1873 or 1863, without paying attention to any increase which has occurred in the size of the cards or capacity of the machinery during this period. The effect of lessening cost of production by means of increased speed and machinery of enhanced capacity is good. It is in the interest of the consumers, and therefore eminently altruistic in its tendency.

The Blast Furnace of the Crozer Steel and Iron Company, at Roanoke, Va.

Among other interesting papers read at the Roanoke (Va.) meeting of the American Institute of Mining Engineers was that of Mr. J. P. Witherow, of Pittsburgh, describing the new blast furnace of the Crozer Steel and Iron Company, at Roanoke, Va. The furnace plant, as there stated, was built under contract by Messrs. Witherow & Gordon, of Pittsburgh. The furnace is 70 feet high by 16 feet bosh; tunnel-head, 12 feet 8 inches, and hearth 9 feet in diameter. The columns are 20 feet high above furnace level, below which they extend 2 feet. The shell is 23 feet diameter at bottom and 19 feet at top. The plate iron is ⅜ inch at bottom, and tapers to ¼ inch, the top ring being ⅝ inch. The furnace is provided with a double bell, 8 feet 4½ inches external diameter and 4 feet 4 inch internal diameter, operated by a 32 x 63 inch air lift, and provided with safety-catch rods. The down-comer, which is surrounded with a spiral iron stairway, is 5 feet 6 inches external diameter and 4 feet 8 inches in the clear, at the bottom of which is placed a dust-catcher. The tuyeres, seven in number, and 7 inches in diameter, are placed 5 feet 6 inches above the hearth level, above which there are four circles of bosh-cooling plates, each plate being traversed with a 1¼-inch gas-pipe coil. The furnace is operated with three of the latest Whitwell fire-brick hot-blast stoves, 18 feet in diameter by 70 feet high, and each having over 24,000 square feet of heating surface.

The products of combustion from these stoves are taken off by underground flues to an iron chimney, 160 feet high by 8 feet in the clear. This chimney also gives draft to a plant of 10 steel boilers, divided into five distinct batteries. Each boiler is 34 feet long, 46 inches in diameter and contains two 16-inch flues. Eight of these boilers, or four batteries, are expected to furnish an ample supply of steam for the whole furnace plant, leaving a battery of two boilers idle for repairs or cleaning. In the accompanying engravings of this plant it will be observed that an arched flue traverses the foundations, so as to communicate with the chimney for additional batteries of boilers, should a second furnace be added to the plant.

The engine-house is 31 x 40 feet in the clear, and contains two of the newest style of Weimer blowing engines; diameter of steam cylinder, 42 inches; blowing cylinder, 84 inches; and stroke, 4 feet. This type of blowing engine is among the foremost in the United States for strength, efficiency and durability, each engine having a maximum capacity of pumping 12,000 cubic feet of air per minute of piston displacement. The pumps are of the Cameron type, two for water supply, and two for filling boilers. The engine-house is roofed with a sway-bottomed water tank resting merely on the walls of the engine-house, without any other support, which is kept filled with water at all times, for the supply of the entire plant. It is 6 feet deep in the center, and the surface of the water is 42 feet 6 inches above the hearth level, or engine foundation.

The casting-house is 138 x 50 feet, outside measurement, and the stock-house 75 x 150 feet. Both of these buildings are roofed with corrugated iron, as is also the hoist-tower and bridge connecting it with the furnace. The hoisting apparatus is of the Crane Brothers system, of Chicago, and the superstructure is wrought-iron channel beams. This furnace has a cubical capacity of about 9000 feet, and when worked up to its reasonable output, under intelligent management, will have a producing capacity of fully 100 tons per day, and can be worked up to 1000 tons per week, if the manager so determine, on an ore containing 50 per cent. of metallic iron, with silica not exceeding 6 to 8 per cent., at a temperature of blast ranging from 1400° to 1600° F.

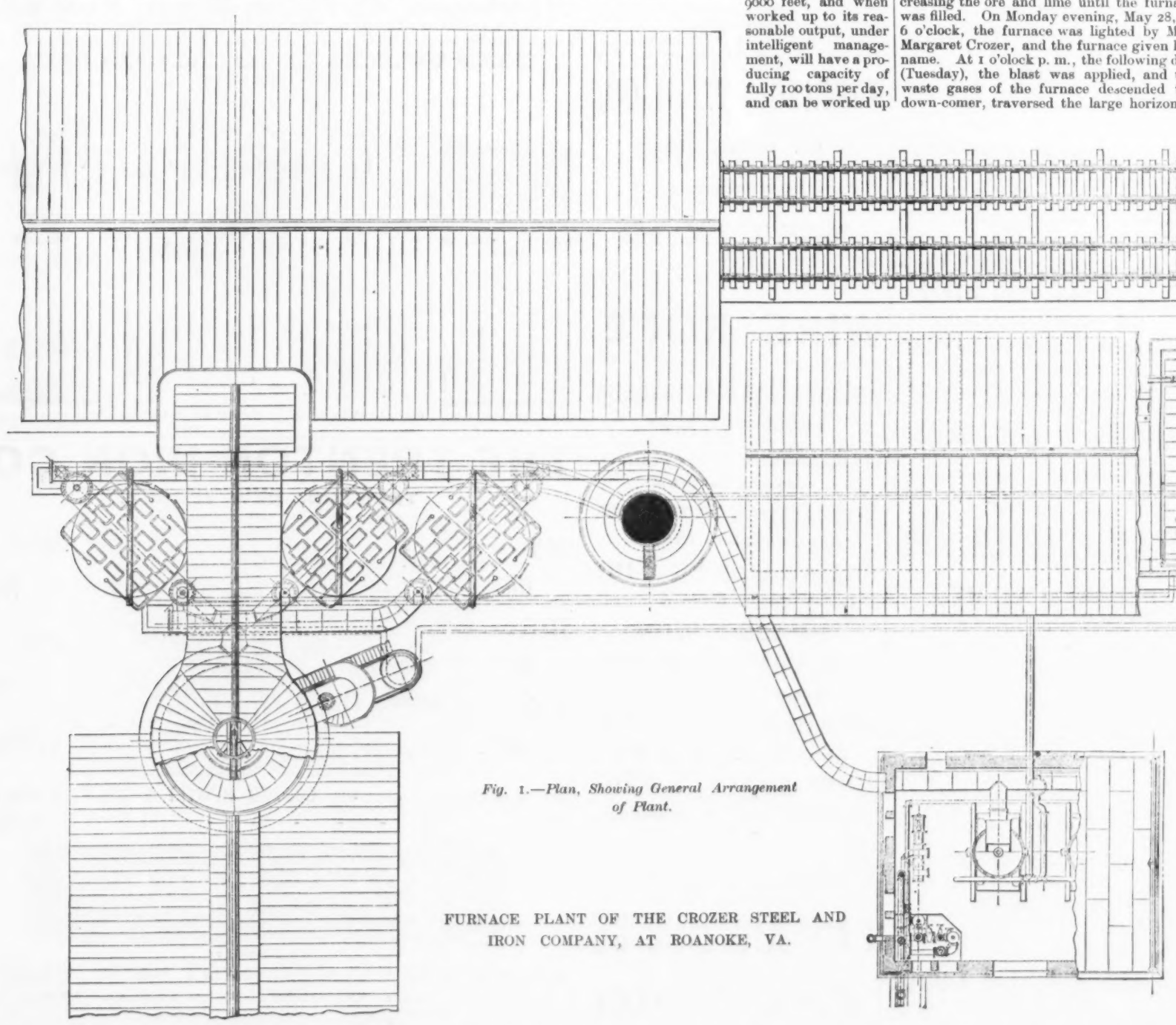

Fig. 1.—Plan, Showing General Arrangement of Plant.

FURNACE PLANT OF THE CROZER STEEL AND IRON COMPANY, AT ROANOKE, VA.

Mr. Witherow submitted the following formulæ, which he uses in determining the capacity or output of a furnace; also, in determining the size of its boiler, engine and draft-stack. He allows, for anthracite furnaces, 60 square feet of fire surface in boilers to produce a ton of iron in 24 hours; therefore, 6000 feet of fire surface will supply steam to make 100 tons of iron in 24 hours. For coke furnaces he allows 40 square feet of heating surface for a ton of iron in 24 hours, or 4000 square feet for 100 tons of iron in 24 hours; and for charcoal furnaces he gives 30 square feet for a ton of iron in 24 hours, or 3000 square feet for 100 tons of iron in 24 hours. This is assuming that the heat of the blast will range from 1300° to 1500° F.

By the same method he determines that 140 feet of air per minute of piston displacement will make a ton of iron in 24 hours with 50 per cent. ores, if not too highly silicious, at a temperature of blast above given; therefore, 14,000 feet per minute will make 100 tons of iron in 24 hours. For charcoal furnaces, on the same ores and at the same temperature, he calculates 110 feet per minute to make a ton of iron; therefore 11,000 feet per minute will make 100 tons of iron in 24 hours. He assumes that the chimney or smoke-stake must have a capacity of carrying off 15 tons of gas (or products of combustion) for every ton of iron the furnace is expected to make.

In deciding on the amount of limestone necessary for a blast furnace (apart from the analysis of the cinder), it is found a good approximate rule to make the amount of lime (*i. e.*, the limestone less the carbonic acid) equal to the sum of the amounts of silica in the ores, limestone and fuel. If more lime is used, it is injurious to good furnace action. It also saturates the escaping gases with an excess of carbonic acid, which lessens their calorific power. A furnace works sluggishly on an excess of lime, and is apt to scaffold.

Concerning the flowing in of the furnace, Mr. Witherow says: "The filling was done by using some 15 cords of wood, on which was put about 15 tons of coke, and then the burden commenced by using 3000 pounds of coke, 1000 pounds of ore and 800 pounds of lime. This was continued by slightly increasing the ore and lime until the furnace was filled. On Monday evening, May 28, at 6 o'clock, the furnace was lighted by Miss Margaret Crozer, and the furnace given her name. At 1 o'clock p. m., the following day (Tuesday), the blast was applied, and the waste gases of the furnace descended the down-comer, traversed the large horizontal flue, flowed under the boilers and the Whitwell stoves, without the least explosion or even the faintest puff.

"There was a difference of opinion with regard to the introduction of fire into the gas flue some time before applying the blast. I maintain that a wood fire should be put in the flue, and I would be glad to submit this question to furnacemen. The operations of the furnace went off satisfactorily. The hearth, however, was too cold for the reception of the ore. It would have been better, I think, to have put in from three to five cords of wood, just sufficient to thoroughly ignite the coke, then about 30 tons of coke, and commence with a burden of 3000 pounds of coke, 3000 pounds of ore and 1200 of lime, continuing this burden until the furnace was filled. As soon as the blast went on, I would have charged 3000 of coke, and 4000 of ore and the same proportion of lime. I maintain this is the proper way of blowing in a furnace. The use of a large quantity of cord-wood, with a small proportion of fuel on the top, and the burdening of a small proportion of ore to fuel, is not good practice, because the wood rapidly consumes, allowing the space that it occupied to be replaced by coke and the furnace burden. Then the small quantity of ore is brought very near the tuyeres before the blast goes on, and before the hearth is thoroughly heated; consequently this ore has a tendency to chill and settle in the bottom, if the furnace is not fortified by the Whitwell stoves. Where a smaller quantity of wood and a larger proportion of coke is put on, with a greater burden, the hearth is filled with incandescent coke, and liquefaction is retarded until the hearth is in a condition to receive the iron and cinder. The regular process begins on a large scale, the hearth becomes filled with hot cinder, the process of combustion goes on steadily and the heat in the stoves is gradually increased, so that no matter how dark the cinder may be for the first day, which is most desirable, the heat will develop more rapidly than the burden can be increased. Within three days the temperature of the stoves must be reduced, or the cold blast put on, so as to keep down the heat, to prevent the iron becoming too gray or silvery. A furnace supported with superheated blast should, therefore, always be blown in on a reasonably heavy burden, and the manager should desire dark cinder for the first two days, and gradually increase his ore burden until he is statisfied that the proper proportions are on the furnace.

"The Whitwell stoves are frequently blamed for the bad working of furnaces, and for unsatisfactory results in an economical point of view, when the whole trouble is in the management. The old practice of blowing-in furnaces is still not unfrequently adopted—that is to say, a great excess of fuel and everything calculated to produce a very gray cinder, and a No. 1 or No. 2 foundry iron at the start. This is not good practice. An excess of fuel is resorted to for the purpose of making the furnace very hot, and may be justified in cold-blast charcoal practice. Where the heat of the blast ranges from 500° to 800° with iron-pipe stoves (commencing at 100° or 200°), there may also be some reason for continuing the old practice. In modern practice, where the furnaces are supported with superheated blast, the fallacy of such a course has been demonstrated, and it is surprising to see it still pursued. This course is often maintained long after the furnace is in blast, and as the heat of the stoves augments in a greater ratio than the increase of burden, the carbonic oxide has little to do in the zone of combustion or the region of the tuyeres, and as the gaseous currents ascend in the furnace, they establish partial liquefaction and cementation in the upper regions of the bosh, often continuing this action up the inwalls, causing scaffolding and bridging. With such a course, especially in anthracite furnaces, the blast is bound to be a failure, as the removal of such obstructions is difficult and rarely effected.

"I think that blast-furnace engineers should establish a system of running the furnace by the temperature of the escaping gases. This temperature indicates the changes more quickly than the cinder or the iron. Other things being equal, the hotter the blast the cooler the top, and *vice versa*, and the increase of temperature at the tunnel-head will sooner indicate to the manager a derangement in furnace action than anything else. As the temperature of the higher zones increases, it will show that there is either an inadequate amount of ore and lime for the ascending gaseous currents and carbonic oxide to act upon, or it will show that the furnace is beginning to cement and scaffold, and prompt measures can be taken to remedy the difficulty.

"*Postscript.*—The amount of foundry iron weighed to-day (June 2) for yesterday's output was 77 tons, which is the fifth day of the furnace's operations. The fuel is very close to a pound of iron with a pound of coke, the furnace being under a burden of nearly 2 pounds of ore to 1 of coke, and the ore yielding over 50 per cent. of metallic iron. This indicates that within a few days this furnace may be making over 100 tons of iron per day, on a fuel consumption not exceeding a pound of coke to a pound of iron."

More recent particulars concerning the working of the furnace show that the yield is now from 80 to 90 tons per day, sometimes reaching over 100 tons, one-third foundry and two-thirds gray forge. The pig made is marketed in the Cumberland Valley and at Harrisburg, Pa., in Baltimore, and to nail mills on the Ohio River. Its quality is

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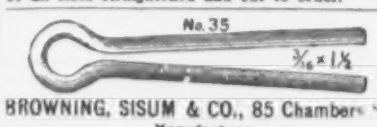

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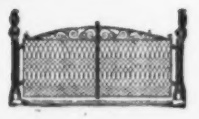
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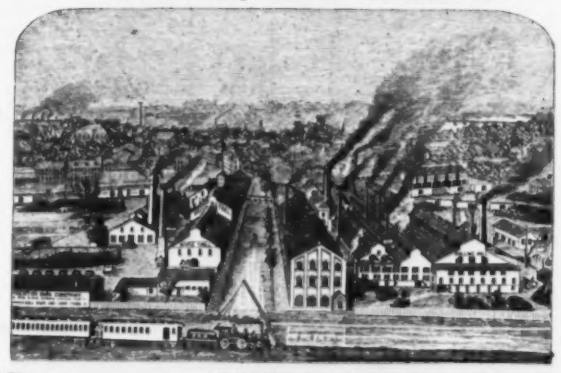

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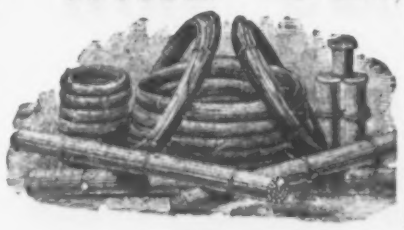

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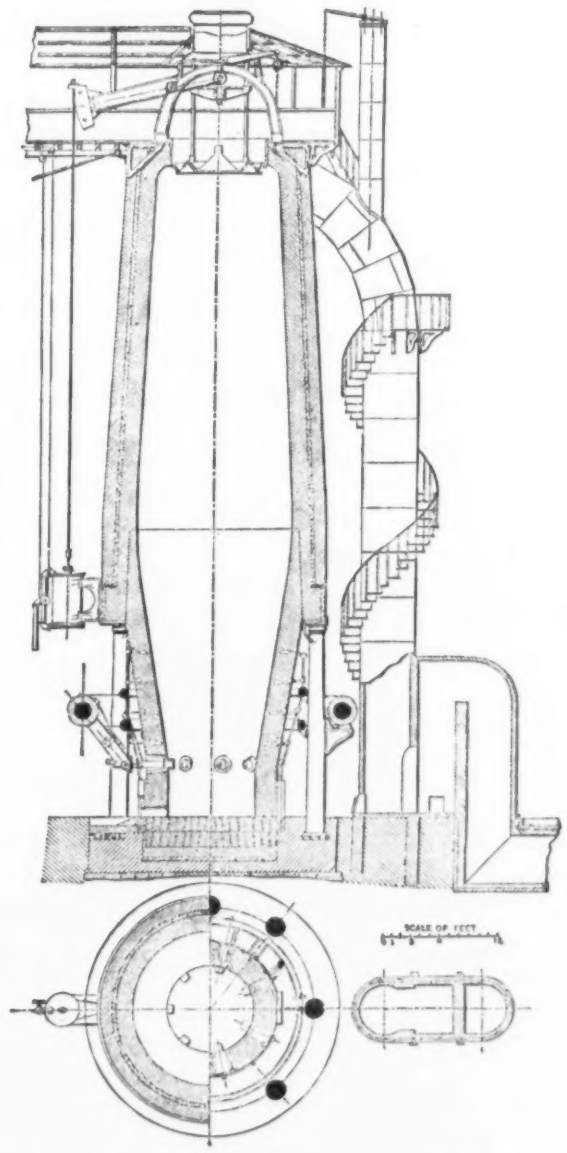
very satisfactory. The ores used were mainly from the Upland mines of the company, near Blue Ridge Station of the Norfolk and Western Railroad, 10 miles from the furnace, and from the Houston mines of the company, near Houston Station of Shenandoah Valley Railroad, 15 miles from the furnace. These limonite ores yielded from 40 to 46 per cent., averaging over 44, in the operations of the furnace. Some limonite ores of the same kind were obtained from the Vesuvius mines, on Shenandoah Valley Railroad, in Rockbridge County, and some specular ores from the Upland mines. The company, we understand, are now using some ore from the mines of the Rorer Iron Company, near Roanoke. The limestone used is dolomite from quarries near Blue Ridge Station of Norfolk and Western Railroad, and near the furnace, and a very pure limestone from quarries on Shenandoah Valley Railroad, near Buchanan. Owing to the delay in getting the coke ovens at Pocahontas, in the Flat-top coal region of the Virginias, on the Norfolk and Western Railroad, in operation, this furnace began with Connellsville, Pa., coke; but now the supply enables it to use about two-thirds of Flat-top and one-third of Connellsville, and it will soon use Flat-top exclusively. The consumption has averaged about 1.4 tons to the ton of iron made. The principal office of the Crozer Steel and Iron Company is at Upland, Pa., not far from Philadelphia. Its officers are: Samuel A. Crozer, president; W. H. H. Robinson, treasurer; Francis E. Weston, secretary, and D. F. Houston, who resides at the furnace, general manager.



Furnace Plant of the Crozer Steel and Iron Company.—Fig. 2.—Longitudinal and Horizontal Sections of Furnace.

The Industries of Leeds.

Mr. E. W. Lightner, in a letter to the Pittsburgh *Dispatch*, says:

In its industrial characteristics Leeds resembles Pittsburgh, looked at superficially, more than any city I have visited on this side of the Atlantic. It has its forests of chimneys; it has its shroud of smoke; it has its soot showers and general dinginess. The great industries of Leeds are woolen factories. The city has a population of 300,000. The streets are excellently paved with block stone. The pavements are kept so clean that no Pittsburgher can drive over them and think of his native city without a blush of shame. The municipal debt is over £2,000,000, or $10,000,000, but for this it has these fine pavements; splendid public buildings; a beautiful park that has cost about £150,000; a plentiful supply of water brought 15 miles from the Washburn River, which is comparatively free from sewage, slaughter-houses and factory contamination; the gas works of two formerly competing companies which the city purchased 13 years ago for £800,000; and several fine bridges which have for some years been free of toll. You will observe that there has been a difference somewhere between the management of public affairs in Pittsburgh and in Leeds. The latter place has a large debt, it is true, but it now has all necessary public properties in fine condition, and can make repairs and reduce the debt without burdensome taxation. The rates are much lower than in Pittsburgh, and the cost of water and gas is trivial by comparison. Gas costs about 45 cents per 1000 cubic feet. The water is measured by Siemens and Adamson's meters, and is furnished for trades purposes at 6d. per 1000 gallons.

Leeds is not looked upon as being by any means a model municipality in England, but its government assuredly grows admirably by comparison with that of some American cities. No city is quite civilized till it reaches the altitude of hansom cabs, and block stone or concrete pavements, clean kept as a Dutch floor. The city has good schools, churches and theaters. In politics it is Radical. When Mr. Gladstone made his famous contest in Midlothian, the Radicals of Leeds, fearing he would be beaten in that district, where no other Liberal would have had a ghost of a chance, put him up as one of their candidates and elected him by a large majority. As he was also elected by the Midlothian constituency, a new election was held at Leeds, and Mr. Herbert Gladstone, son of the Premier, was chosen, and Mr. Herbert Gladstone is a Radical of the Radicals. Almost invariably there are Radical majorities where there are large numbers of workingmen. The Conservatives are the champions of the moneyed power, of great corporations and great land owners, and of the unrepresentative body known as the House of Lords. A mere Liberal is a sort of Conservative in disguise. The hope of Great Britain for a more republican form of government reposes in the Radicals, who are both aggressive and progressive.

At considerable expenditure of time and patience I have succeeded in getting what I believe to be the most correct statement of prices paid to all kinds of workmen and women that has been presented to the public with reference to this region, the great manufacturing district of England, and which govern generally in the United Kingdom. I attach much importance to these figures, because they fairly serve to show what working people earn in all this country. In some localities a few workmen having special skill or employed at labor which makes an extraordinary demand upon muscle get higher wages, and I have not included puddlers, refiners and plate rollers, because they invariably make enough to live comfortably, though their less fortunate associates may suffer greatly from lack of work, the iron industry very rarely furnishing regular employment. I know how managers of newspapers detest a long array of figures, but I hope these will be endured, and that my autocratic friend, the proof-reader, will treat them with his most distinguished consideration:

In the department of woolen cloth manufacturing workmen receive the following wages for a week consisting of 56½ hours, the minimum and maximum price being given in English shillings: Card cleaners, 22 to 26; rag grinders, 25 to 35; spinners, 25 to 35; loom tuners and designers, 25 to 30; weavers, 18 to 25; other workmen average from 18 to 23; women weavers and card fillers, 9 to 12. The better class of skilled workmen among the cloth finishers, such as cloth-pressers and stuff-pressers, make from 30 to 50; others from 22 to 26, and the laboring dyers from 18 to 22. First-class tailors make from 30 to 35, and second-class from 25 to 30 per week of 60 hours. Tailoresses, first class, from 10 to 15, and second class, from 6 to 10 per week of 56½ hours. The introduction of improved machinery has not only vastly lessened the number of working people engaged in all departments of woolen manufacture, but the wages paid to those who remain are lower. One person in the spinning mills will do the work that was once done by half a dozen, and in the great clothing-making establishments suits are cut out by machinery, a dozen suits being cut at once. These are given out to men and women who have machines at their own homes, and are called "slop made." The best suits, made to order, are, of course, cut singly, and they are made entirely by hand.

In the department of iron manufacturing, boiler makers receive: Platers, 40 to 45;

riveters, 30 to 36; angle-iron smiths, 35 to 40; dollyholders, 25 to 28; machinists, fitters and turners, 26 to 30; millwrights and smiths, 28 to 32; model makers, 28 to 35; smiths' strikers and laborers, 17 to 21; the week's work for all of them consisting of 54 hours. In forges and iron works the men are paid for a day of about seven hours; forehand, 14; furnaceman, 12; bar man, 9; leverers, 5 to 6; fireman, 4/ 6d. carrier-out, 4/; puller up, 3/ 6d. Brass and iron founders work 54 hours a week and get: Brass molders and workers, 30 to 36; iron molders, 30 to 34; core makers, 28 to 30; laborers from 18 to 20. In the building trade, bricklayers make from 30 to 33 per week of 50 hours; stonemasons, 30 to 33; plasterers, plumbers and slaters, 30 to 32; carpenters and joiners, 28 to 30; other laborers from 18 to 24. At brick and tile making, common brickmakers get from 17 to 21 for a week of 56½ hours; fire-brick makers, 18 to 23: retort makers, 30 to 40; glazed brickmakers, 40 to 60; these form a small percentage of the workmen, a great majority being boys and common laborers, who get from 5 up to 18. Painters and paper hangers make from 20 to 40, according to skill. Coal miners make from 20 to 27 per week of 46 hours; bank men, 18 to 19; boys, 7 to 12. Flint glass and bottle blowers make from 36 to 45 per week; the men work in lots, one-half making six hours and the other the same, making 12 hours per day five days of the week. The wages are 25/ per week, but they are allowed extras which enable them to average about the above sums. Railroad workmen work from 60 to 72 hours per week and get: Engine drivers, 30 to 45; stokers, 18 to 28; signalmen, 21 to 27; goods guards, 24 to 30; passenger guards, 24 to 28; porters, 17 to 24; plate layers, 17 to 24; engine cleaners, 17 to 21. In other departments of trade boot and shoe makers get from 25 to 35 for a week of 56½ hours according to skill. But in this work many boys and women are employed, who get from 5 to 15. Compositors get 32/ for a week of 54 hours; brushmakers, 28 to 33 for 54 hours; bakers, 28 to 30 for 60 hours; carters, 17 to 21 for 60 hours; coachmen, gardeners and teamsters, 22 to 28 for 60 hours; policemen, 22 to 28; flax mill workers, 25 to 30 for 56½ hours—women and girls, 6 to 19; coopers, 28 to 32 for 56½ hours; cooks, women, from £16 to £20 per year, besides food; housemaids and other servants, £10 to £16 per year and food; street and other common laborers, 15/ to 21/ per week of 54 hours.

I shall have more to say at another time with reference to the iron business, but I think the above is sufficient to show that the mass of skilled workmen do not receive more than from 25/ to 28/ per week, and that from 19/ to 22/ is the utmost hope of the common laborer. Now, you may well wonder how a man can keep his family comfortably on this sum, or even on the maximum sum. The answer is that he cannot. But neither do the mass of American working people live comfortably. The English workingman has the advantage of low rents and cheap clothing, and in many respects cheaper food, though this assertion may seem strange. I give here a carefully compiled estimate made by an intelligent workman of the expense of maintaining his family, comprising himself, his wife and five children, the eldest a boy of 12, for one week:

	£	s.	d.
House rent and rates	0	4	0
Meat of all kinds	0	5	0
Two and a-half stones of flour at 1/10	0	1	7
Milk	0	2	0
One pound butter	0	1	2
One pound lard	0	0	7
Vegetables of all kinds	0	1	6
Children's school fees and newspaper	0	1	2
Two cwt. of coal, and gas	0	1	6
Insurance against sickness, death, &c.	0	1	0
Average for boots, clothing and household stuff	0	4	0
Groceries and other requisites	0	3	0
Total	£1	8	6

To enable a workman to save even 1/ or 1/6 per week, he must therefore earn at least 30/. But it must be remembered that a majority of families have two or more persons earning something; for here the wife is almost always expected to assist to maintain the household, and children are taught to turn a penny as soon as possible. Meats are about the same prices as in America; so is flour, butter and eggs. Vegetables and groceries are cheaper. Clothing is much cheaper. A workman's suit of best black cloth for Sunday wear may be had for £2. 5/, and a good working suit for from £1. 5/ to £1. 15/. Boys' and girls' good strong suits can be bought for from 10/ to 20/.

However they manage to do it, I must say that I do not find here in Leeds that industrious workmen's families are in a worse condition than in large industrial cities in America. A great many have money in the bank. Many have invested in the Building Association, which lends money to its depositors and shareholders at 4 per cent. on freehold property which they may purchase, and occasionally on leasehold, as in Huddersfield, where no one can purchase a foot of ground outright from Sir John Ramsden, the owner of a large territory. The Building Association gives its borrowers 24 years in which to pay, the payments to be made in small sums monthly or half-yearly. I was shown in the vault of this society thousands of deeds for freehold property which were being held subject to final payment of the sum borrowed with which to purchase. The association pays 3½ per cent. and lends at 4. Where land can be bought at all, it is not held at a higher figure, and often not as high, as it would be when similarly located in an American city, and a house can be built at much less expense than in America. Thus, with the aid of the building societies, many working people are enabled to buy lots and build houses. But rents are so low that there is really no great inducement in this direction.

The Leeds Co-operative Society is also a great help to its members. It has been in existence since 1848, has 20,000 members to whom it pays a bonus yearly, according to the purchases made, has large stores where everything is supplied that humanity can want, owns mills and factories, has purchased a spacious property in the center of the city where it has been doing business, and is about to tear down the buildings now in use, and erect others commensurate with its vastly extended necessities. The plan is to sell all kinds of goods at the market price, and then pay a bonus at the end of the year

according with the profits, and to each member according to his purchases. It is a grand thing for working people, and only requires honesty and good managerial talent to make it successful wherever it is attempted. Paupers are undoubtedly more plentiful in this district than in any place of which I have knowledge in America. Taking districts which are a fair sample, the indoor and outdoor relief shows a pauper element which is about 2½ per cent. of the population. The places investigated are Leeds, Hunslet, Halbeck and Bromley, having a population of nearly 500,000. It costs less to maintain paupers here, however, than in America, where politicians manipulate the funds. My honest conclusion from what I have seen here is that the industrious, economical, sober-working people of this region will compare favorably as to condition with their prototypes in America. That condition is dreary enough, but what are they going to do about it? Money rules the camp, the court, the grove, and men below, if not heaven above.

Pittsburgh's Industries.

Some facts and figures relative to the manufacturing statistics of Pittsburgh, as shown by the last census, are decidedly interesting, notwithstanding the fact that they are incomplete and in some cases even inaccurate. Some explanation may, therefore, not be out of place in this connection. Pittsburgh, as is well known, is a great manufacturing community, of which a large number of the establishments are situated at points just outside the city lines. Of the 250,000 people who get their living from the commercial and industrial enterprises of the city, 100,000 live in the manufacturing suburbs, within a radius of 10 miles, while of the manufacturing industries which are operated by Pittsburgh capital, do all their business through Pittsburgh, and are as truly part of her interests as any located within the city lines, fully one-third in number and over one-fourth in number of hands and value of product are located in the surrounding towns. The census report naturally observes the geographical division, and reports only such establishments as are located within the city lines. The difference which this arbitrary division makes is shown by the following comparison of the manufacturing totals of the census for Pittsburgh and those of the county of Alleghany, of which only an inappreciable portion could properly be reckoned outside of the legitimate industries of the city:

	Pittsburgh.	Alleghany County.
No. of establishments	1,112	1,895
Capital invested	$52 845,000	$70,641,426
Hands employed	36,520	49,171
Wages paid	$17,186,988	$22,371,951
Value material used	42,109,777	61,739,273
Value of product	75 915,033	105,272,739

The census of Pittsburgh alone ranks her as only the fourteenth city of the United States in the number of manufacturing establishments. In the amount of capital invested in her manufactures, Pittsburgh is ranked by the census as the fifth city of the country, while in the number of hands employed the return for the city proper gives her only the ninth place, and in wages paid the eighth. In the value of manufactured product, which is low on her leading staples, Pittsburgh proper is the ninth city of the country by the census report, while the total of the manufactures in the county is the seventh in the United States. A comparison of the manufacturing statistics of the leading industrial counties would show the relative importance of the manufacturing centers more clearly than the comparison of the 20 leading cities afforded by the census.

The further inadequacy of the census return is strongly indicated by the comparison of the totals of the census for the manufactures of Allegheny County with the totals of the report of the Pittsburgh Chamber of Commerce. Of the manufactures of the two cities of Pittsburgh and Allegheny in 1881, the latter shows a total of capital invested in manufactures of $105,401,481, against $70,641,426 credited by the census report to the entire county for the previous year. In like manner the Chamber of Commerce reports the total number of hands employed at 85,436, against 49,171 given by the census, while the value of the product in 1881 is stated by the local report at $145,721,619, against $105,272,739 in 1880 by the census. A portion of these differences may be held to cover the growth of the city in the year. A portion, also, might be credited to the natural disposition of a local organization to give its totals, so as to make the most favorable showing possible. But the Pittsburgh Chamber of Commerce report was remarkably clear from that tendency, and, indeed, what errors have been discovered in it since it was issued last year were in the other direction. Giving both ideas due weight, it is tolerably clear that there is a large difference, which can only be accounted for by the incompleteness of the census returns upon the manufacturing industries of Alleghany County.

Other reasons why the figures of the census report cannot be analyzed as presenting a fair view of Pittsburgh industries are shown by the utter absence from its table of such branches as the 12 boiler and tank manufactories, turning out $1,450,000 of production in 1881; 16 brass foundries, with a production of $1,300,000; six saw and tool factories, with a production of $1,345,000, and seven stove foundries, with a production of $600,000. Other instances could be given, a portion of which may be ascribed to a difference in classification between the census report and the Chamber of Commerce report, but which must argue the superficiality of the census report itself to a great extent. The opportunities for giving a statistical showing of the enlargement of the industries of Pittsburg since the census year—except such as may be drawn by the enlarged totals of the Chamber of Commerce report, which was published last year—are confined to the official figures of iron and steel production. As those industries form, in a great measure, the foundation of Pittsburgh's industrial activity, the following statement of the production of iron and steel in Alleghany County, from the annual report of the American Iron and Steel Association, will give a fair indication of the enlargement of the volume of Pittsburgh industries during the past three years:

	1880.	1881.	1882.
Pig iron—No. of blast furnaces	15	15	16
Total make, tons	300,497	385,453	358,840
Finished iron—No. of rolling mills	30	30	31
Product of iron rails, bar, angle, bolt, rod and hoop, tons	287,253	402,119	336,628
Sheet and plate, tons	80,599	75,767	71,038
Nails, kegs	419,098	488,916	459,228
Total rolled iron, tons	389,107	505,182	430,627
Steel—No. of steel mills	17	17	18
Crucible steel ingots, tons	52,136	61,256	59,596
Other steel, including Bessemer, tons	169,819	247,145	258,501
Total steel, tons	221,955	308,601	318,097

Four of the steel mills included in the above report are also iron-rolling mills, so that they appear twice in the number of establishments, but not in the amount of product. The above table shows that while from 1880 to 1881 there was an increase in the production of 8,000 tons of pig metal, 116,000 tons of rolled iron, and 87,000 tons of steel, there was a retrograde movement in 1882 on the first two classes, the production of pig iron having decreased 27,000, tons, while that of rolled iron fell off 75,000 tons. This is directly attributable to the strike, which held the iron works idle during four months of 1882. As the loss in product is not by any means in proportion to the loss of time, it will be seen that the real significance of the showing is an actual gain in productive power. Steel made another gain in 1882 of nearly 10,000 tons over the large product of 1881. These figures argue very plainly the steady enlargement of the iron and steel production of Allegheny County, not so much by the addition of new establishments as by the expansion and improvement of the older works.

The relative importance of Pittsburgh to the iron and steel industry of the whole country is also shown to have increased by the official figures of the American Iron and Steel Association. In 1880 Alleghany County produced 7 per cent. of the pig iron made in the United States, 21.21 per cent. of the rolled-iron product of the entire country, and 15.9 per cent. of the total domestic production of steel. In 1881 the proportion increased to 8.4 per cent. on pig iron, 23.15 per cent. on rolled iron, 17.34 per cent. on steel. In 1882 the strike principally affected Pittsburgh, and consequently her ratio of the production of the entire nation fell back somewhat, but not to the degree that might have been expected from the duration of the strike. The percentages for that year were 6.5 per cent. on pig metal, 19 per cent. on rolled iron and 16.35 per cent. on steel. When the figures for 1883 are completed next spring, it is safe to predict that the importance of Pittsburgh's production will have sustained, if not increased, the percentages shown by the returns of 1881. In examining the table of manufactures for Pittsburgh the most distinctive feature is, of course, the iron interest, and the subsidiary manufactures arising out of that industry. From the Chamber of Commerce report is taken the following summary of the different manufactures of metal in Pittsburgh and Allegheny for 1881:

	No. establishments.	Capital invested.	Hands employed.	Value of product.
Iron rolling mills	36	$15,020,000	18,925	$30,242,257
Iron blast furnaces	16	4,890,000	2,285	8,766,493
Steel mills	17	10,170,000	7,600	18,378,836
Agricultural implements	5	400,000	365	675,000
Boilers, tanks, &c.	12	645,800	405	1,450,000
Brass founders	16	683,000	330	1,300,000
Iron bridges	3	570,000	752	1,462,000
Hardware	5	391,000	416	500,000
Copper	2	600,000	120	975,000
Founders and machinists	35	2,470,000	2,083	3,953,000
File works	5	20,000	40	80,000
Guns, pistols, &c.	5	100,000	59	257,000
Iron fences	6	100,000	85	204,000
Iron roofs and cornices	3	167,000	141	316,000
Railway supplies	6	1,415,000	1,102	3,177,817
Saws and tools	6	911,600	834	1,345,850
Stoves	7	444,000	406	663,000
Safes	4	100,000	127	441,450
Steam pumps	3	85,000	60	110,000
Miscellaneous lead and iron	7	1,510,000	1,050	5,961,921
Totals	199	44,710,800	36,625	80,232,624

It will thus be seen that the metal-working branches of manufacture, though numbering but little more than one-tenth of the total of manufacturing establishments in Allegheny county, employ over 40 per cent. of the capital and number of workmen, and turn out 55 per cent. of the aggregate value of production. The ratio of growth shown to exist in the manufactures of bar iron and steel may be generally predicted of the entire metal-working interests of Pittsburgh. Other special branches of manufacture are shown in the following summary:

	No. establishments.	Capital.	Hands employed.	Value of product.
Glass and glassware	59	$5,585,000	6,442	$6,832,000
Coke	60	10,854,500	5,559	4,473,569
Tanneries	14	1,190,000	345	2,185,000
Fire-brick and tile	10	855,000	845	1,069,500
Oil refineries	16	.....	980	4,000,000

These, with the metal branches already referred to, constitute the distinctive industrial features of Pittsburgh. The coke industry, as given above, represents in a large share the establishments in the Connellsville region operated by Pittsburgh firms, and as such their place among Pittsburgh manufacturers may be a doubtful propriety. The same may be said of the coal interest, in which 67 Pittsburgh firms are engaged, with mines located along the railways and rivers of Western Pennsylvania, in which $15,552,000 of capital is invested, 17,962 hands are employed and $12,208,306 worth of coal mined in 1881. Among the branches more common to all cities are the 21 breweries, with $1,895,752 of production; 7 distilleries, producing $4,470,000 worth of liquor; 35 cooperage establishments, with a product of $1,150,000; 3 cotton mills, product $785,000; 4 chemical and acid factories, product $1,283,583; 3 flouring mills, product $1,155,930; 57 furniture and chair factories, product $1,220,000; 8 white-lead and linseed-oil works, product $1,672,000; and 111 establishments working in lumber, including barge builders, turning out $5,688,000 worth of work.

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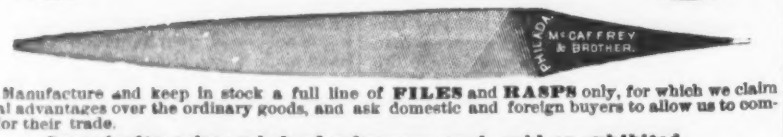

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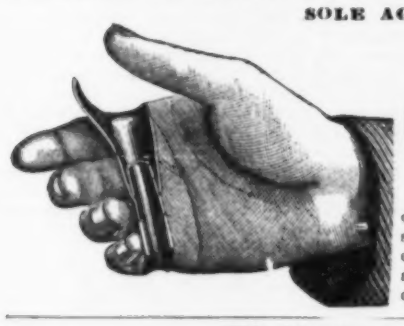

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Lightning,
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Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
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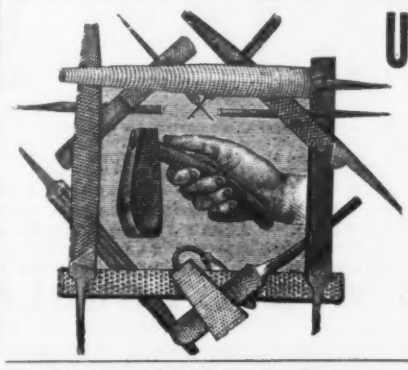

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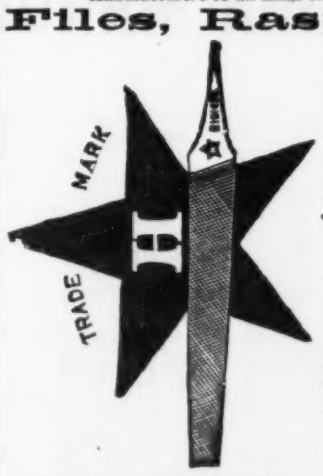

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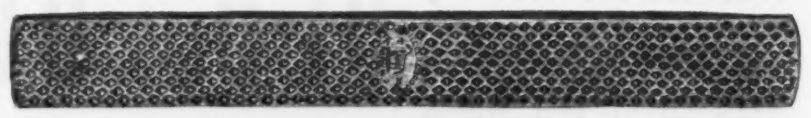

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Coal Dust and Colliery Explosions.

Some few years ago, says a writer in the *Iron and Coal Trades Review*, the mining world was rather surprised and alarmed at the advancement of a theory to the effect that very small proportions of inflammable gas, much less than could be detected by a safety lamp, in conjunction with fine particles of coal dust in the air of a coal mine, were capable, on ignition, of producng an explosion of great magnitude. This was a theory calculated to cause much alarm and anxiety to all persons in charge of mines of a dry, dusty nature, especially as it had always been accepted as a recognized fact that if the air of a mine was kept in such a pure state that no trace of inflammable gas could be detected by means of a safety lamp, the mine might be worked with perfect safety. Consequently, the chief aim as regards ventilation has always been—by placing furnaces at the bottom of the up-cast shafts, or mechanical fans of large dimensions at the top of the same, and by maintaining underground airways of large and adequate sectional area, so as to reduce the frictional resistance there met with to the lowest possible extent—to produce enormous currents of air, traveling at great velocities, and by judicious internal arrangements to conduct the same around the working faces and back to the up-cast shaft, in order to dilute and render harmless the gases that may be discharged from time to time from the working faces and old goaves.

It has, however, been conclusively proved by the experiments of Mr. Galloway, Professor Abel and others, that even in a colliery so ventilated, if it be of a dry, dusty nature—that is, if fine coal dust is found adhering to the sides of the airways and covering the timbers placed therein for the support of the same—if the air contains even a small percentage of inflammable gas, very much less than can be detected by means of a safety lamp, then under certain conditions as to velocity, &c., great danger exists, and should an open flame be by any means exposed in such an atmosphere, the risk of a serious explosion is very great. More recent researches on this subject, by the same gentlemen, have led them to go even further than this, and to come to the conclusion that the presence of inflammable gas, even in small quantities, is not necessary, but that air saturated with coal dust alone becomes highly dangerous, and all that is required to cause an explosion is a combination of circumstances; something occurring whereby there is a sudden increase in the velocity of the current, a flame, and, simultaneously, a cloud of dust. Such a theory as this, emanating from such high authorities as those referred to, induced the writer to conduct some experiments for himself, with different dusts obtained from the mines under his charge, and although he has not been able to go so far as the gentlemen previously named, and to satisfy himself that a mere mechanical mixture of coal dust and air is at all capable of directly producing an explosion, unassisted by the admixture of some percentage of gas, he is thoroughly convinced that it is an element of great danger, and does add very much to the disastrous effects of an explosion of gas in a mine.

It may, however, be the means of indirectly, as it were, causing an explosion of gas, for from experiment the writer found that by passing a current of air, saturated with coal dust, free from any percentage of gas whatever, over a gas jet burning in a box designed to represent the gallery of a mine, the flame was gradually lengthened as the velocity of the current was increased, until, at a velocity of about 12½ feet per second, the flame traveled right to the end of the box, a distance of 21 feet, and in another case, at a velocity of 27 feet per second to the end of the box, a distance of 40 feet, and in either case the writer believes the flame could have been carried to a much greater distance, could the box have been lengthened and the cloud of dust kept up at the same velocity. From this it can easily be imagined that should a cloud of dust, traveling at a high velocity in a mine, become by any means ignited, flame may be carried forward to the edge of a goaf containing gas or to a district where the air contains such a small percentage of gas as not to be detected by the safety lamp, and an explosion of varied magnitude be the result. The writer found that it was not practicable—with the dusts experimented on—to propogate a continuous flame at velocities under 12½ feet per second, although in all cases the length of the flame became greater as the velocity increased, but it is quite possible that such may be the case at less velocities with dusts of a more highly sensitive nature. It would therefore appear that producing enormous currents of air, traveling at high velocities, is in dry, dusty mines but the means of rendering them more unsafe, a statement which may appear to be somewhat paradoxical, but it is nevertheless true. Managers of mines of this description are therefore placed in a somewhat anomalous position, or, as it were, between two dangers; because, in modern mining, when colleries are of so much greater extent than was formerly the case, and necessarily so on account of the enormous capital required to develop them where the depth is great, and when inflammable gas is so freely given off from the face of the coal, and at such enormous pressures as have recently been proved in one of the British coal-mining districts—in some cases over 400 pounds per square inch—it is absolutely requisite to produce such an amount of ventilation as will dilute and render these discharges of gas harmless. By so doing the velocity of the currents in the main airways must necessarily be high, and the danger, consequently, from coal dust materially increased.

Thus, while endeavoring to reduce the danger arising from inflammable gas to the minimum, it is but the means of increasing the danger arising from coal dust, and *vice versa*. As the discharges of inflammable gas from the goaves and working faces cannot in any way be controlled, the necessary ventilation must be produced to remove the consequent danger, and endeavors made to lessen as much as possible that arising from coal dust. It would therefore appear to be desirable, in very dry, dusty mines, to endeavor to prevent the possibility of currents traveling at high velocities coming in contact with flame, and to accomplish this it seems expedient to prohibit naked lights of any description whatever being used in such pits, and to work the same exclusively by means of suitable safety lamps, capable of standing the test of not passing the flame at the highest velocities in which they may be placed, such lamps being lighted, examined, and locked on the surface, and not again opened until their return. It would also seem advisable, where explosives are used (and it is necessary that such should be employed in all pits more or less) to take the precaution, if dry dust exists where the explosive is to be used, to water the mine for a sufficient radius from the point of ignition. Traveling roads where there is much traffic by animals and workmen are better for being occasionally watered, in order to prevent clouds of dust arising, and in such mines where water cannot be used by reason of the thill being of a soft, spongy nature, ordinary common salt is often beneficially employed and answers practically the same purpose. Such, then, is briefly the part played by coal dust in the working of coal mines. Much more might be added, but sufficient has been said to show that coal dust is an element of considerable danger, and cannot be too carefully looked after by all connected with mines of a dry, dusty nature.

Responsibility of Railroads for Breakage of Stoves in Transit.

In the case of Lee vs. the St. Paul, Minneapolis and Manitoba Railway Company, decided recently by the Supreme Court of Minnesota, it appeared that the plaintiff shipped at Chicago, by the Chicago and Northwestern Railroad, a carload of stoves consigned to himself at Moorhead, Minn. The stoves were carried over the Chicago and Northwestern and Omaha railroads to St. Paul, and thence to their destination over the defendant's line. The defendant, instead of transferring them to its own cars at St. Paul, allowed them to be carried over its own road in the car in which they had been carried from Chicago, and billed them through in that car from St. Paul to Moorhead without opening it or inspecting the contents. When the car was opened, upon reaching its destination, the stoves were found to be badly broken. Plaintiff sued the defendant for damages and recovered judgment. This judgment and an order denying a new trial were affirmed by the Supreme Court, which, in the course of its opinion, said: "Where goods have been transported by several successive carriers, and it appears that they were in good condition when delivered to the first carrier, the jury may presume, in the absence of evidence to the contrary, that the goods reached the hands of the last carrier in the same condition as when delivered to the first carrier on the line. This rule is founded upon important considerations of public policy. This rule is not modified or changed by the fact that the last carrier, instead of transferring the goods, transported them over its line in the foreign car in which it received them. As a matter of convenience to the carriers themselves, this is usually done where the freight is received in carloads for a common destination. To indulge in a different presumption in such cases would, as business is now conducted, practically abrogate the rule referred to. We can see no distinction in this respect between goods transported by the carload in a locked car and goods transported in a package nailed or otherwise fastened up. If there can be any difference, it would be in favor of applying the rule more strictly in the former case than in the latter, for we see no reason why the carrier would not have the right to open the car for the purpose of inspecting the contents—a right which they might not have in the case of closed packages. Of course, we are not now speaking of cars in transit from a foreign country in bond and under the seal of the United States Custom House authorities."

Activity in Delaware Shipbuilding.—There has been a remarkable development in Delaware shipbuilding since the first of the year. During that period 5 steel, 51 iron and 36 wooden vessels have been constructed, upon which the weight of iron used was 31,810 tons, or 63,620,689 pounds. The tonnage of the wooden vessel aggregated 20,456. At the Chester shipyard of John Roach 12 vessels were built, with an aggregate tonnage of 23,309 tons. The operations of John H. Dialogue, at Kaighn's Point, were confined principally to the construction of tugboats, seven of which have been completed, and in the building of which 523 tons of iron were used. The Messrs. Cramp's Sons have performed considerable shipbuilding since last January. In building the Tacoma 4,200,000 pounds of iron were used, and in the construction of three other steamers 4400 more tons of the material were used. In the construction of Jay Gould's yacht Atalanta there were used 600 tons of iron and steel. No vessels have been completed yet at the new yard of the American Shipbuilding Company, Port Richmond, although work has been commenced on nine. Since the first of the year two building yards and two repairing yards and marine railways have been established at Camden.

The fourth of the large iron ferryboats being built by Messrs. Ward, Stanton & Co., of Newburgh, N. Y., for the passenger transfer service of the New York, West Shore and Buffalo, and the New York, Ontario and Western Railroads, was successfully launched a short time ago. All four of the ferryboats are of the same size, and the cost of each is placed at about $150,000. They are named the Newburgh, the Kingston, the Albany and the Oswego, the latter being the vessel recently launched. In size and power they will compare favorably with any ferryboats in New York Harbor. The first two named are completed, the Albany is nearly ready for service and the Oswego will be done in about six weeks.

According to a statement recently made by Dr. Norvin Green, the messages received in the New York offices of the Western Union Telegraph Company range from 80,000 to 85,000 per day.

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JOHN WILSON'S
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ACKNOWLEDGMENT AND AGREEMENT.

"WHEREAS, I, GEORGE A. ROBINSON, of West Mansfield, County of Bristol, State of Massachusetts, have heretofore manufactured and sold certain Knives bearing a Mark which is claimed to be an imitation of the trade-mark owned by John Wilson, of Sheffield, England, which consists of four peppercorns and a diamond, under the mistaken belief that I had the right to do so.

NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson to sue me for damages for the wrong aforesaid, I do hereby undertake and agree,

FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid, or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESS:—
E. M. REED."
(Attorney for Defendant.)

G. A. ROBINSON. L.S.

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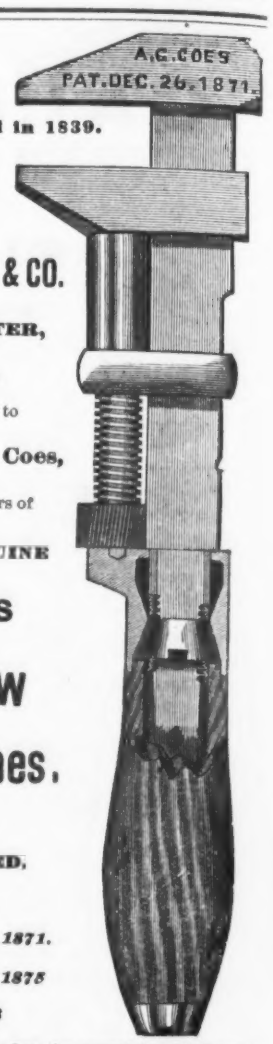

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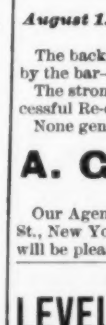

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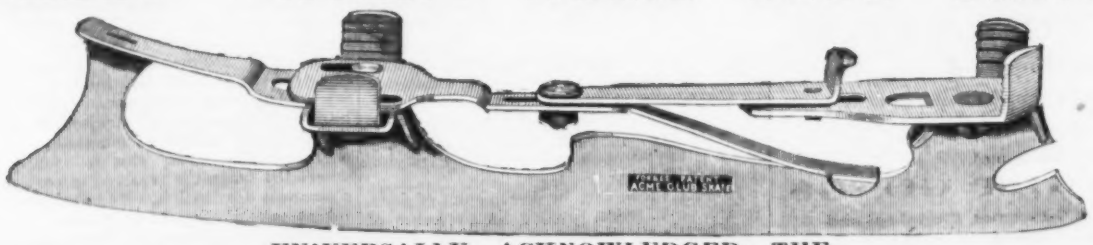

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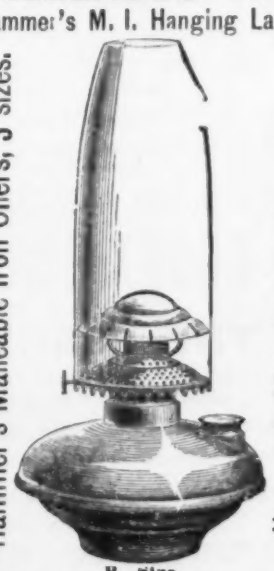

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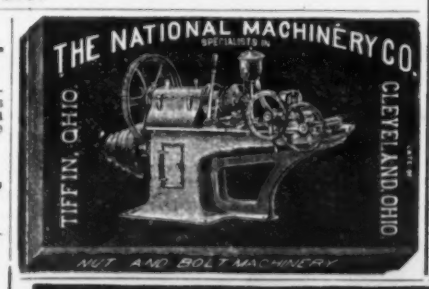

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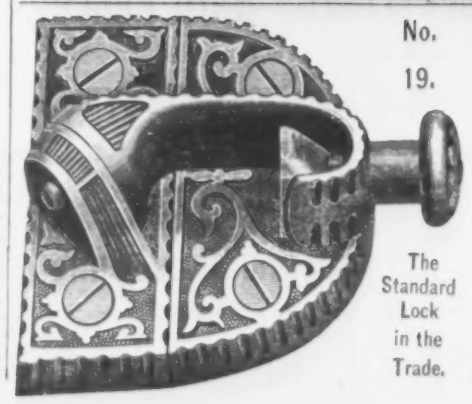

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Standard Time.

A correspondent of the Philadelphia *Railway World*, writing on the above subject, which of late has received so much attention, remarks:

Anything more crude, uncertain and insufficient than the style now in use cannot well be imagined. It is a relic of the Dark Ages, adopted centuries before a railroad or telegraph was thought of. Modern progress demands something better adapted to the wants of our present advanced civilization. Whatever change is made will doubtless be initiated by the railroads of this country, and, if it proves satisfactory, will eventually extend throughout the world; for which reason it is to be hoped that whatever action they may take in the matter will have so broad and catholic a basis as to admit of its universal adoption. In the discussions which have arisen in considering this problem, it has been conceded that the remedy lies in establishing a standard, or standards, of time of universal or local application. It must, I take it, be assumed that any plan or reformation which may be decided upon by the railroads of the country will encounter a strong opposition from the mass of the general public. The conservative feeling which makes people reluctant to surrender an established custom and adopt something different in its place would, I apprehend, prevent any legislation on the subject for some time to come. But, fortunately, it is not necessary that the laws of the country should be invoked in the matter. The question is one which primarily affects nothing but railroad schedules and railroad timepieces, and is entirely within the control of each company or companies, respectively or collectively. Due regard, however, should be had for the public interests and convenience, and any change that is made should, so far as is possible, be in accord with the existing condition of things. It would seem as if the problem might be solved by adopting the recommendation which has been made, and ably advocated, of taking as the standard the astronomical time of Greenwich, England, according to which the day begins at noon and is divided into 24 hours, numbered from 1 to 24.

The Observatory at Greenwich furnishes the best known time that exists. It is exact, constant and known (or ascertainable) everywhere. It is used in astronomical observations and calculations, as the basis of tables used in navigation, and for mathematical and scientific purposes generally, so that its adoption by railroads would bring them into harmony with the other cosmopolitan pursuits of the world. I can foresee the objections likely to be urged against the adoption of Greenwich time. It would probably be contended, as it has been, that inasmuch as the hours of the day would run from 1 to 24 instead of the day being divided into halves of 12 hours each, as is the present civil day, great inconvenience would result to the public. And, further, that inasmuch as the clocks and watches throughout the country would all register the time at Greenwich, people would be going about their avocations at strange and unnatural hours. Now let us see what these objections amount to. I would, however, premise by saying that there is no use in ameliorating an evil if it can be as easily eradicated, and that any reform that is attempted cannot be too thorough if the best results are to be obtained. Some inconvenience will necessarily follow any change, and the compensating benefits should be made as great as possible. A clock is merely an instrument designed to measure the flight of time, generally having 12 grand divisions shown on a dial, covering the time from midnight to noon, and the converse. The particular names by which its several divisions or indicated periods are known is of but minor importance in comparison with the exactness of the information derived therefrom. Should Greenwich astronomical time be taken as the standard, 12 o'clock midnight would become the end of the twelfth and the beginning of the thirteenth hour. Two o'clock a. m. (present style) the beginning of the fifteenth hour; 6 o'clock a. m. (present style) the beginning of the nineteenth hour, and so on around the circle. In a short time the people would become accustomed to speaking of the hours of the day in this way and the novelty of it would soon wear off.

According to the system proposed, if the sun set at Greenwich at the beginning of the seventh hour (6 p. m., present style) 15° west on the same parallel of latitude it would set one hour later, or at 7 p. m., present style; 30° west, two hours later; 75° west, five hours later, and so on to 60° east, where it would set 18 hours later, and simultaneously become visible at Greenwich six hours before the beginning of the next day. From this it will be seen that the hour of the day bears no conventional relation whatever, as at present, to the rising and the setting of the sun. To demonstrate the disadvantages attending the present style it is only necessary to instance the familiar illustration of a ship sailing around the world. If going west, the ship's log contains a record of a blank day—interpolated, in fact—while if sailing to the east a day has to be added, thus occasioning, to say the least, what should be an uncalled-for absurdity. Again, it daily occurs in the United States that we receive the morning intelligence of events which have taken place in Europe and Asia in the afternoon of the same day. If we read in the papers that something has transpired in even such well-known cities as London, Paris or Berlin at a given hour, how many persons know exactly when it did occur? The advantages which would result from the proposed change would be certainty and uniformity. There would no longer be any question about New York, Philadelphia, Washington, Pittsburgh, Chicago, and 50 or more other standards of time now in use by the railroads of the United States. By getting rid of a. m. and p. m. it would no longer be necessary to print railroad timetables with such devices as are now adopted to distinguish between night and day trains. Such notations as "the time between 12 o'clock noon and 12 o'clock midnight is indicated by heavy-faced type," and "heavy rules on left hand of columns indicate trains between 6 p. m. and 6 a. m.," would no longer mystify and distract the average traveler.

In making the change suggested, it should be done simply in the interests of railroads, and care should be taken to make no attempt to force its acceptance upon the public by legislative enactment or otherwise. If the people throughout the land have local time which suits them, let them have the undisturbed enjoyment of it. Experience has fully demonstrated that railroad time is the standard which is in general use along the respective railroads of the country, and it would not be long before Greenwich time, if used by the railroads, would be used universally, to the exclusion of any other.

A Well-Appointed Malleable Iron Works.

The Worcester Malleable Iron Company have nearly completed the erection of their new enterprise at East Worcester, west of Putnam Court, between the tracks of the Worcester and Shrewsbury and Boston and Albany railroads, where they have 70,000 feet of land for their works, adjoining both roads, on which they have a frontage of 462 feet, their lot being 166 feet wide at the west end between the two roads, and 123 feet wide at the east end. The ground was broken for the building of their works April 23, and within four months from that time they calculated to have them completed and in operation. The buildings consist of an office, 40 x 26 feet, located at the west end; molding shop, 167 x 50 feet, along the north side by the dummy track; the pattern shop and storeroom building, 130 x 25 feet, and two stories in hight, extending east from the north end of and at right angles with the molding shop; the annealing shop, 50 x 50 feet, east of the pattern shop; the engine and boiler room, 20 x 20 feet, and core-room 20 x 40 being between the molding and annealing shop. The annealing furnace chimney is 75 feet high, the boiler chimney 40 feet high, and the air furnace chimney is to be 100 feet high, it not yet being completed. The cupola furnace stack is 40 feet high. The cupola furnace is one of the Colliau patent, 34 inches in diameter inside the shell, and 24 inches inside the lining. They have put in one of Stewart's boilers of 35 horse-power, and are putting in one of B. W. Payne & Sons' horizontal steam engines of 25 horse-power, made at Corning, N. Y. In the first story of the pattern and storeroom building are to be the foreman's office, wash-room for the workmen, pickling room, tumblers' room and general storeroom, the latter at the south end; in the second story are to be the carpenters' and pattern makers' rooms, the machine shop aed a general storeroom.

The molding shop is 15 feet high, surmounted by a monitor roof 15 feet high and 30 feet from the ground, and 20 feet wide, with glass windows along both sides, the building being supported from the top by trusses, with timbers of moderate but sufficient size, admitting all the light from above. The amount of light admitted into the molding shop may be judged from the fact that on the north side alone are 27 windows, each 12 x 4 feet, and the monitor windows have a surface of 280 x 5½ feet, furnishing upward of 1500 square feet of additional lighting. The annealing shop has also a monitor roof and is similarly lighted. The office building is finished in hard pine shellaced; the walls and floor are being made fire-proof. In the office are rolling desks for the bookkeeper, superintendent and officers, and in the rear is a laboratory room, made specially proof against fire. The basement of the office building has a cemented floor, and is designed, by its protection against dampness, for a pattern room. In the rear of the office building is a shed for horses and carriages. Alongside the spur track connected with the Boston and Albany road is built a retaining wall for a coal shed, 80 x 15 feet, with ready access to the furnaces. The officers of the company are: Joseph P. Mason, president; Charles H. Bowker, treasurer; and Gottfried Lundberg, the architect of buildings, superintendent. The carpenter work of the structures was by H. W. Eddy; mason work by P. Foster White; plumbing by John J. Phelan; and both the slate and gravel roofing by George A. Barnard. The establishment, which will soon be in successful operation, comprises another important addition to the growing industries of Worcester, contributing largely to its business prosperity.

A gentleman who has just returned to San Francisco from a visit to Scotland is said to have successfully negotiated the transfer of a large area of California timber lands, for a sum aggregating between $1,500,000 and $1,750,000, to a recently organized corporation in Scotland, known as the California Redwood Company. The purchase embraces land, mills, tugs and other incidental accessories to the general lumber trade. The main object of the new enterprise is to meet the demand that is developing at Eastern and European capitals for fine redwood lumber for interior house finishing and ornamentation. It is only of late that outside attention has been given to the products of the Pacific Coast, and California redwood has rapidly gained favor among those by whom the study of fancy woods is accepted as partaking somewhat of æsthetic character and taste. In the whole world there are no known redwood forests outside of California. Carefully prepared official estimates give the quantity at 25,825,000,000 feet, and this amount is comprised in the coast belt that extends from Humboldt County, just below the Oregon line, down as far south as the Mexican border.

Birmingham, Ala., known as the Magic City, has had a growth not less remarkable than that of some of the famous Western towns. In 1873 it was a ragged village of 2500 inhabitants. In that year it was nearly depopulated by a cholera epidemic. An era of railroad building set in in the State, and the intersection of two lines there brought Birmingham's population up to 4000 in 1880. A census just completed gives the city, in 1883, 11,345 inhabitants. The assessed value of property has increased in three years from $3,000,000 to $8,300,000. The growth of the town is due to the development of the iron-ore and coal mines in the vicinity.

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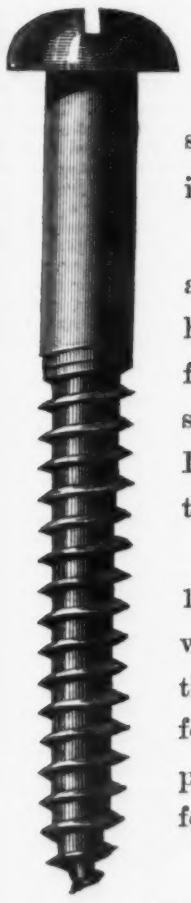

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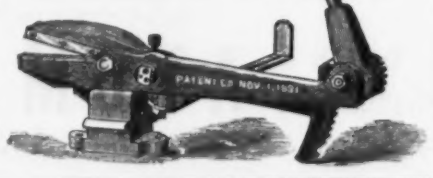

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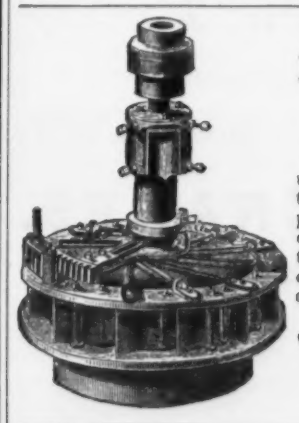

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Trade of China in 1882.

The just-issued report of the Chinese Customs Department on the foreign trade of China in 1882 is of special interest at the present time, when a blockade of the ports of the country is talked of, and the French operations in Tonquin threaten to seriously disturb the relations of China with foreign countries. It shows the enormous interest which England has in maintaining these relations undisturbed. There has been a very marked falling off of the foreign trade of China in 1882, as compared with the previous year, although the report does not state that this has any connection with French doings in that quarter. The Haikwan tael, in which the value of the trade is given, is equal to about $1.45. The value of the foreign trade in 1882, we are told, dropped from 163,000,000 taels in 1881, to 145,000,000 taels in 1882. This is the lowest total since 1878, when it was 138,000,000 taels. In all the leading commodities trade has been very dull and unprofitable both for Chinese and foreign merchants. Indian opium has felt more severely than ever the influence of the native crop. Cottons and woolens have also gone down, notwithstanding that prices have reached a very low point, while, on the other hand, the Chinese staples, silk and tea, have been less sought for and fetched lower prices—silk, it is stated, owing to competition with Japan, and tea owing to competition with both Japan and Assam. The chief falling off in the Chinese trade has been in imports, which for 1882 amounted to 78,000,000 taels—14,000,000 less than in 1881. Nearly three-fourths of the deficit is laid to the account of Indian opium, the quantity of which imported in 1882 was 13,365 piculs less than in 1881, which, added to the marked decrease in price, created a deficit in imports of over 7,000,000 taels for Malwa opium alone.

Of cottons and woolens we find a falling off in the total value of 5,000,000 taels as compared with 1881, woolens especially having gone down very low. On the other hand, there has been a rise in the imports of raw cotton, kerosene and seaweed, kerosene alone having increased from 3,332,000 gallons in 1881 to 8,256,000 gallons in 1882. The value of Chinese exports in 1882 was 67,000,000 taels—4,000,000 taels less than in 1881 and 10,000,000 taels less than in 1880. The quantity of raw silk exported was much the same as in 1881, but the value was less by 2,500,000 taels. In 1879 and 1880 the export of this commodity had reached 76,000 and 78,000 piculs. The falling off in silk piece goods has been very marked when compared with recent years. The total value exported in 1882 was 22,837,252 taels, less by 4,000,000 than 1881, by 7,000,000 than 1880, and by 6,000,000 than 1879. The total value of tea exported in 1882 was 31,332,000 taels—1,500,000 less than in 1881 and 4,500,000 less than 1880. Thus, silk and tea together account for a deficit of 5,500,000 in exports, which is slightly counterbalanced by the rise in sugars and in cotton, straw-braid, mats, skins and wools. With regard to opium, the falling off has been most marked in the northern ports, mainly due, it is believed, to the great improvement in the quality of the native-grown opium, and this though the price of Malwa opium has fallen considerably. Other causes of the fall in opium imports are stated to be the efforts of the authorities to check the smoking of the drug and the gradually depressed state of trade. The report lays most stress on this last cause, and states that we must not be too certain that Indian and Persian opium are already in full retreat, at least from the Yangtse ports, as they are from North China. At the same time, it seems evident that much opium is imported into Formosa and South China which does not come under the cognizance of the Customs Department.

Importers of piece goods, we are told, pronounce 1882 to have been the most unsatisfactory period since 1877, partly, it may be, owing to the market being overstocked from the previous year, and partly from the less prosperous condition of the country people, but partly also to general dullness of trade and the marked decrease in the exports of silk and tea. We find some interesting remarks on American piece goods, especially sheetings and drills, the chief American imports of this class into North China. Their price, we are told, is still too high, and no marked increase can be expected till the price of labor and the improvement in the yield in the United States make it possible to lay these goods down at a lower price. "It is not a question of supplanting English makes, for these latter will also be cheaper than now whenever American makes shall be cheaper than now. It is not a question of the one being preferred, because it is 'not sized,' over the other, which is sized, for the Chinaman has his reasons for wanting to buy both the sized and the unsized; but it is merely a question of reducing the cost to a point within the reach of a larger number of purses than can afford to indulge in such excellent material for their underclothing." While there has been a considerable falling-off in the export of black tea, that of green tea is answerable for two-thirds of the deficit.' The export of green tea has during the last 10 years fallen from 235,400 piculs in 1873 to 178,839 in 1882. The competition of Japan tea is supposed to have in part produced this result; but it seems also to be due to the changed conditions in the trade of the United States, where green tea is largely consumed. The import tea trade there has got into the hands of a few importers, who rush the tea off at comparatively low prices by auction. A very special and somewhat provoking cause is assigned for the marked falling off in the China silk trade for the last two years.

A wealthy Chinese banker has been buying constantly and kept up the price, even when the depressed state of the Lyons and London markets would otherwise have brought prices in China down so low as to facilitate a large export. This operator held in 1881, 8000 bales; in 1882, he held 14,000 bales. Another important factor in the silk trade for 1882 has been the excellent quality of the Japan crop, which has interfered with the China trade. A glance at the various detailed tables in the report shows at once the great share which Britain and her dependencies have in the China trade. Of the total imports and exports, Great Britain alone is put down at about one-third in 1882—41,000,000 taels out of 145,000,000. If we add to this the value of the trade with Hong Kong, India, the Australian and other British Colonies, the total comes to something like 111,000,000 taels, or quite three-fourths of the whole trade with China. The United States comes next in order, with 11,700,000 taels, while the whole of Continental Europe, Russia excepted, is put down for only 11,236,000 taels. The whole of Russia's trade, both in Europe and Asia, with China amounted to 4,950,000 taels in 1882. The trade with Japan came to over 7,000,000. The imports from Great Britain came to 18,755,000 taels, and the exports to 22,300,000 taels. On the other hand, the imports from Hong Kong much exceed the exports to that port, the former amounting to 29,000,000 taels and the latter to 16,500,000 taels, while the difference in the case of India is still more marked—the imports from that country amounting to over 18,000,000 taels, while it took from China only to the value of 447,000 taels.

The exports from China to Australia, 2000 taels, were four times greater than the imports from that continent. Of tea, England in 1882 took one-half of the whole quantity exported, over a million piculs. As to shipping, again, out of the 24,729 vessels of all nationalities, including Chinese, of 17,388,852 tons which entered and cleared the various ports in 1882, 14,337, of 10,814,779 tons, were British, while only 192, of 172,381 tons, were French. The Chinese themselves had 6429 ships and junks, of a total tonnage of 15,589,969 tons. Germany comes next with 1864 vessels, of 882,856 tons. The total revenue derived by China in 1882 from the trade carried on at her ports was over 14,000,000 taels, or close on £4,000,000. With regard to the future position of British shipping in the Chinese trade, Mr. J. H. Hart, the Commissioner at Shanghai, makes some pertinent remarks. The preponderance of the British flag, he states, is maintained, but each succeeding year will show an increase in the number and tonnage of vessels under the Chinese flag. In the coast and river trade the competition lies almost entirely between the British and Chinese flags, the British percentage of the whole being 54.89 per cent, and the Chinese 42.58 per cent. As regards the foreign trade, the percentage under the British flag is 67.75 per cent. of the whole, but as the China Merchants' Company are gradually extending their operations by employing their vessels in a direct trade with foreign countries, the present British share in the foreign trade is not likely to be maintained.

Patent Office Proceedings.

The pressure which arises at times in the Patent Bureau at Washington in the train of special classes of inventions again directs attention to the fact that the extensive business of the bureau yields the Government a handsome annual profit. From figures now at hand it appears that last year its receipts exceeded its expenditures by $325,351. As the law now stands the Commissioner of Patents cannot use this surplus fund to bring up arrears of business, or for any other purpose connected with the current work of his office. The excess must be turned over to the Treasury, even though the office be short of "fuel and lights," as indeed it was at the close of the last fiscal year. The "patent fund" in the Treasury arising from this source has been growing for several years, and on the 1st of January of this year it amounted to $2,205,471. Inventors, patent-office attorneys and the Commissioner of Patents naturally protest against this as in effect an unintended tax upon invention, and argue that Congress should annually expend at least enough of this surplus fund to secure the prompt disposal of the current work of the Patent Office, which, by activity in trade, sometimes runs into arrears.

The business of the Patent Office has been steadily increasing since its establishment (as now organized) in 1836. It was in existence, however, long before that date—indeed, from the first year of the Government under the Constitution, which instrament, in Section 8 of Article I, empowered Congress to promote the progress of science and the useful arts by securing to authors and inventors the exclusive right to their respective writings and discoveries. There was legislation under this section as early as April, 1790, and further acts of Congress in 1793, 1800, 1810 and 1828; and on July 4, 1836, it was organized under the act of the last-named date on its present basis. Since then its statistics are accessible. In 1837, 435 patents were issued; in 1847, 569; in 1857, 2896. At the beginning of the civil war the annual issue had reached 4778. Of course, during the continuance of the war no applications were received from the Southern States, and, except in certain lines, there was less activity of invention in the North. Only 3329 patents were granted in 1861, and 3532 in 1862. In 1864, however, the issues reached a higher figure than ever before—5025. The general resumption of business in 1866 and 1867 resulted in more than doubling this number, the issues of the latter year being 13,026. Last year, between the first of January and the first of July, 10,137 patents were issued. The figures for the corresponding months of 1883 are 12,660. It is likely that the issues for 1883 will exceed those of last year by more than 400.

When the number of patents granted to each State of the Union is considered, it appears that more than half the total issues last year were to citizens of New York, Pennsylvania, Massachusetts and Ohio. A total of 1843 patents were granted to Pennsylvania, and but 45 to South Carolina; 1422 to Illinois; 196 to Kentucky; 1815 to Massachusetts; 56 to Mississippi. In the ratio of population, however, Connecticut maintains the lead, her citizens having received 794 patents, or one to every 782 persons. The ratio in Alabama is one to every 27,445 persons, and so the proportions run when the different geographical sections of the Union are compared.

The workshops of the Canadian Pacific Railway Company, at Hochelaga, are now almost completed, and the company already have a number of engines under way.

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AND

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"Overproduction."

If a cotton manufacturer be asked what is the cause of the present depression in that trade, he will reply, "overproduction." So will a leather manufacturer, a maker of woolens, a silk weaver, a carpet manufacturer, a steel maker and a wire-drawer. These trades and many others are suffering from a condition of partial paralysis. There is a demand for a limited quantity of the goods they can make, but only for a limited quantity, and, therefore, if some establishments run at full time, they do so at the expense of the trade of some others, which are obliged to cease doing business, perhaps temporarily, but often permanently. At such a time the concern which can place its goods in the market at lowest cost is master of the situation, and is, therefore, the fittest to survive. This peculiar and distressing condition of affairs always follows a season of feverish and heedless activity. A rush to buy enables the producer to advance his prices and to keep them up, and they always keep as high as they can be sustained. Manufacturing establishments consequently become abnormally profitable at such a time, and invite the investment of capital in extensions of existing works to bag bigger profits, or in the erection of new works to take a share of the good things going. One of two results then ensues—either the demand exhausts itself and diminishes, or the increase in the capacity of the works outruns the growth of the consumption of their products. In both cases the works are affected the same; they reduce prices and continue to reduce them, while buyers hold off and purchase as sparingly as possible, believing that they can buy cheaper the next week or the next month. Then come suspensions, failures and general depression.

These periodical convulsions in trade belong more particularly to our own time than to the remote past. When every household made its own homespun clothing and wove its own linen, when carpets were made on hand looms and were only seen in the homes of the wealthy, when iron was so scarce that metal pots and pans were cherished heirlooms, when travelers slowly journeyed from place to place on horseback or in clumsy vehicles, when money was seldom seen and exchanges were effected in goods, when banks were few and their deposits insignificant, there could have been no such occurrence as a great disturbance of trade through overproduction. The invention of the steam engine, the development of machinery and the concentration of great productive power in closely-peopled factories; the introduction of railways and steam vessels, and the rapid and cheap conveyance of food and manufactured goods through their instrumentality; the multiplication of banks and financial institutions, and the tremendous power of the large accumulations of money thus secured—all these, as well as other powerful agencies not so prominent, have had their influence in shaping our present splendid, but evidently unbalanced, industrial development. Railroads, banks and workshops depend so closely on one another that whatever affects one interest is felt by the others. They work hand in hand in extending civilization, in providing what we now believe to be the necessaries of life, and in sustaining the great exchanges which perform nationally the same functions that are performed by the circulation of the blood in the human system. Periodically we have national debility, languor, health, exuberant vitality and high fever.

This condition of affairs seems to be inevitable and incurable. The nation is now apparently in a condition of languor. No artificial remedy can be applied. Recovery of health must come naturally. The experience of the past teaches us that it will only come through the gradual shrinkage of production until it is on a parity with the diminished consumption, or through the natural increase of consumption. These are slow, painful and disagreeable processes. If the restriction of production could be so regulated by some controlling power that it would take place uniformly, there would still be trouble, because there are works encumbered with debts whose income would not then be large enough to clear their liabilities. These are the establishments which may be expected to succumb first under the diminished demand and unremunerative prices. Badly-located or badly-managed works will follow next, and at last well-equipped and well-managed and well located works will, here and there, be forced to yield if the level of consumption is not touched by previous suspensions. There can be no safeguard erected against these inevitable trade convulsions They seem to be inseparable from present economic conditions, and could only be prevented by the non-accumulation of capital, the suspension of fresh territorial development, or the destruction of all enterprise and ambition. As long as money collects in masses in the hands of banks or capitalists, as long as there are inviting fields for profitable investment, and as long as there are enterprising or ambitious spirits to conceive and direct business ventures, there will be extensions of manufactures whenever favorable conditions exist, to be invariably followed by overproduction and depression.

Material Development in the South.

It is very gratifying to observe in the Southern press constant testimony of the great change which the last few years have wrought in the industries of the South. The cotton crop is no longer regarded as almost the sole dependence of that section of the Union, but manufactures are receiving the attention to which they are justly entitled. The magnificent natural resources of the vast empire which stretches from the Potomac to the Rio Grande are being developed, and every paying investment attracts fresh brains and more capital to its vicinity. With the advance of the industrial era comes a demand for better means of transportation, and the multiplication of railroads and the better equipment of old lines have grown apace. The activity which has thus been freshly imparted to the South has borne fruit in other directions. Farmers have awakened to the fact that wheat, corn, fruit and vegetables can be raised and disposed of at profitable prices, and now the South is almost independent of the West for its supply of breadstuffs, while its shipments of fruit and vegetables to the North are yearly increasing and bring much gain to the enterprising growers. Improved agricultural methods go hand in hand with the diversification of industry, and it is safe to predict that the cotton crop of the South will be all the larger, under favorable climatic conditions, for the attention given to other crops and the progressive ideas received by farmers, who have at length been convinced that they can learn something new about their own business. This conclusion is proved by the fact that last season's cotton crop was the largest ever produced, falling but a few bales short of 7,000,000. The crop this year will be smaller, as the weather has been unfavorable, but coming seasons will see these figures greatly exceeded. And the more of this crop that is manufactured where it is raised the greater will be the gain of those who raise it, and, therefore, the stronger will be the inducement to continue its cultivation. The growth of the South in the manufacture of cotton goods is shown by the statement that 40 per cent. more bales were used by Southern cotton spinners last season than in the one previous. The total number of spindles added to cotton machinery in the United States last year was 660,000, of which 180,000 were taken by Southern States.

Cotton will continue to be the leading crop of the South, but in addition to the "pitch, tar and turpentine" of the Carolinas, the sugar of Louisiana and the rice of the Savannahs, the agriculturists of the Southern States will also from year to year reap increasing benefit from the vegetables of the South Atlantic coast, the fruit of Georgia and Florida and the breadstuffs of the interior. Sheep and neat cattle are being raised in increasing numbers, and enable a profit to be realized on land either unfit for cultivation or unsuitably located for tillage. And all over the South the workers in mill, factory, furnace, shop and forge are forming a distinct class of consumers of agricultural products and dispensers of money, whose influence is being felt in the greater abundance of currency and the gradual abolition of the primitive system of barter which has prevailed there from time immemorial. The influence of the Atlanta Exposition has had a great deal to do with the rapid extension of Southern manufactures, which had long before that time been started, but were developing rather slowly. One man, Mr. E. P. Howell, of Atlanta, states that he personally knows of $8,000,000 which have been invested in Georgia as a direct result of that exposition, and that sum by no means marks the limit of investments thus influenced. The Louisville Exposition, which is now in progress, will continue the good work begun at Atlanta and direct fresh attention to the wealth-making opportunities in the South, and next year the New Orleans Exposition will keep the ball rolling. The South is moving energetically in the direction of progress, and its future is one of unbounded promise.

The Wire Trade.

The situation in iron and steel wire is one of marked depression. This depression is perhaps more strongly defined than in almost any other branch of the iron and steel trades. The demand is very much below the capacity of the mills, and prices are lower than has ever before been known in this country. For instance, No. 12 plain steel wire has been sold, delivered in Chicago, at under 3¼ cents per pound. Not only is this price phenominally low for American wire, but it is also lower than the price of foreign wire of the same quality, if it could be delivered in Chicago free of duty. It goes almost without saying that wire is now sold at less than cost to any but the best organized mills. The remedy for this state of affairs which can be most easily applied is no doubt in curtailed output, which has already been done by the larger mills. The largest wire mills in the country are those of the Washburn & Moen Mfg. Company, at Worcester, Mass.; the Gautier Steel Department of the Cambria Iron Company, at Johnstown, Pa.; the Oliver Wire Company, at Pittsburgh, Pa.; the Cleveland Rolling Mill Company, at Cleveland, Ohio; and the New Haven Wire Company, at New Haven, Conn. These five establishments turn out about two-thirds of the wire produced in the United states. Their curtailment of output is not only the result of intention, but also of accident, the works of the New Haven Wire Company having recently been burned, but are in course of rebuilding. Fire has quite busy among wire mills lately, as those of R. H. Wolff & Co., at Annville, N. Y., and the works at Spencer, Mass., have also been destroyed by it. The curtailment of production, however, will have to be much greater than has yet been effected to secure recovery from the existing depression.

The manufacture of wire, like the manufacture of steel rails, owes its expansion to the unfortunate "boom" of 1879 and 1880. The demand for wire for fencing along the lines of the railroads which were then put under construction, both from railroads and from settlers, grew extraordinarily fast, and wire mills doubled and trebled their machinery to keep up with their orders. Prices advanced, the business was profitable, there was an abundance of work, and other people improved the opportunity and put up wire mills. The subsidence of the railroad fever not only seriously and directly affected the wire mills, but it also indirectly affected them through other industries with which the manufacture of wire sympathizes. The general dullness in business extends to wire as well as everything else. Merchants and consumers hesitate to order stocks of wire ahead in times of slow sales, just as they decline to carry stocks of bar iron under the same circumstances. The uncertain condition of the barbed-wire litigation also has a tendency to induce stagnation. Heavy interests are involved in the early settlement of this question, but it is now in such shape that no prediction can be hazarded as to when the final decree may be expected. Meantime the manufacture of barbed wire goes on, of course, but not so briskly as it undoubtedly would if makers and users were sure they would not some time be called to account and have to pay heavy royalties. The uncertainty of the situation may be learned from the statement that a year ago the license of a barbed-wire works, making 10,000 tons annually, was sold for $150,000, but it would probably not now bring one-tenth of that amount. The stagnation in the wire trade and the current low prices may also be traced to another cause. Under the fear that the duty on steel-wire rods would be greatly increased, many wire makers last winter ordered and received a year's stock of rods. Having bought the rods and invested their money, they are bound to realize, and therefore are obliged to make and sell wire, even though they do not receive actual cost. This condition of affairs will right itself gradually with the exhaustion of material or of capital, and may be regarded as temporary and incidental in its character.

The low price of wire naturally leads to the query: If steel wire is now made here as cheap as foreign wire can be imported, why do we not export wire? The cost of making wire for export can be still further reduced by making application for a rebate of the duty paid on the imported rods of which it is made. A rebate of nine-tenths of the duty is allowed; therefore an export trade is possible. Some wire is exported at present, and if the depression in the domestic trade continues, or grows worse, an increasing quantity will be sent abroad. It must be borne in mind that it is a very few years since steel wire was first made in this country. The Cleveland Rolling Mill Company were the pioneers in this direction, and they put up a wire mill to dispose of their steel-rail ends, which were accumulating so rapidly that it was difficult to use them all in the way commonly adopted at Bessemer steel works. The wants of the country have not been fully supplied by the steel-wire makers until within the past two years. Now, however, as our mills can make much more than we need, outside markets will be sought, and they will evidently be sought with characteristic American vigor. We hope that relief may come to the wire trade through domestic channels as well as through an export demand. If the farmers are in good financial condition this fall, they will be in the market for wire fencing as well as for general goods, and the stimulus thus imparted to trade will be felt all along the line, and will stiffen prices and insure an expanded consumption, regardless of slow-moving courts and tedious litigation. The turn in the trade may not be far off, as experience shows that any goods will not long be sold under cost.

British Rail Exports.

Recent developments in the export rail trade of Great Britain have shown conclusively that the iron-rail trade is now very near extinction. The whole of the exports, in fact, are at present estimated as being less than would a few years ago have been turned out by one of the many mills then at work in the different districts. The falling off in iron rails was gradual, and for a number of years past a steady decline was experienced; but it is only lately that there has been a drop in the total exports of rails. Reviewing the figures relative to the iron-rail exports for the first seven months of the past three years, we find that the quantities shipped amounted to 18,570 tons, 36,013 tons and 82,939 tons, respectively, showing a total decline since 1881 of some 64,369 tons. The falling off, it appears, was experienced in connection with almost all the countries enumerated in the statistical returns, being most marked so far as the United States are concerned, but those countries which were not enumerated specifically, but were grouped as "other countries," showed an increase. From a total of 2852 tons in the first seven months of 1881, the amounts shipped to these countries rose to 5098 tons in the same period of 1882 and to 8576 tons in 1883, an increase worthy of some attention, pointing, as it does, to a possibly very important growth of Great Britain's export trade in this direction. Though not indicated by these figures, it is more than probable that steel rails also will be taken by these countries in increasing quantities, and the anything but cheerful outlook for Great Britain's iron-rail trade is thus modified to some extent.

Careful inspection of the statement of British exports of iron and steel rails for the first seven months of the year shows that the demand from Russia has ceased almost entirely; Germany also has practically ceased to supply her wants from British sources, while Spain, Sweden Norway have taken increased quantities, the Spanish imports, in fact, being almost double those for the corresponding period of last year. Italy, though absorbing considerable quantities, has rather diminished her requirements this year, and the United States show a total decline of about 84,000 tons, as compared with the exports of last year. Brazil and British North America both show a comparatively slight falling off, British India and Australia, on the other hand, having taken increased shipments. The record for the other "countries," previously small consumers, shows that there has been a rapidly-increasing demand since 1881, and for the present year the exports amounted to 138,648 tons. Taken altogether, the exports of steel rails during the first seven months of the present year amounted to 456,024 tons, being some 24,000 tons in excess of the exports of last year. Still, it is by no means safe to predict a satisfactory result at the end of the year, and the circumstance that the requirements for new railways have been greatly reduced will undoubtedly have an appreciable effect in modifying the figures. At the present time, however, it is thought that the low prices now prevailing may possibly stimulate purchases, and thus bring about a favorable result. On the whole, Great Britain now seems to realize the fact that her foreign customers for rails are gradually growing less in number, and that future fields of enterprise must be sought in the many smaller countries which hitherto have had little, if any, importance as affecting the condition of her export rail trade.

The verdict of the coroner's jury in the Riverdale explosion case is curious enough. It attributes the disaster to the failure of Engineer Taulman and United States Inspector Cauldwell to perform their duties. The jurors were not unanimous in censuring the engineer, but there was no difference of opinion among them as to the negligence and responsibility of the inspector. This seems fair enough at first sight; but what share has the engineer in the responsibility? Was it his business to point out to the inspector defects which the inspector should have seen for himself? He would have lost his position had he done so, and it is doubtful if the inspector would have taken the trouble to verify his statements. If the inspectors are supposed to rely on what the engineers tell them, we might as well let the engineers make out the certificates. We are not surprised, however, that the jury find the present system of inspection, as prescribed by the United States law and performed by United States inspectors, "inadequate to the due protection of life." Obviously. Every system which may be tried will be found inadequate until the law is simplified to a single provision, which fixes the responsibility in the event of an explosion where it belongs—on the owner or owners who cannot show that they have taken all reasonable and proper precautions of safety.

The Condition of the Iron Trade.

During the past week there have been no developments of importance in connection with the sale of iron and steel. Trade moves along in about the same proportions as last week. A little more activity is displayed in some lines, but there is a little less in others, so that general conditions have not changed. Under the circumstances, there could be no significant fluctuations in prices expected. At such times as these, when prices are very close to cost and sales are made with difficulty, there is an increasing tendency among manufacturers to deal directly with the consumer, and thus avoid a division of their very small profits with sales agents and brokers. Consequently, a greater degree of dullness may appear to prevail than is really the case, if only sales on commission or by dealers are taken into consideration. For instance, at present many dealers report a complete absence of orders, and it might be inferred from such a condition of affairs that the consumption of iron and steel was almost at a standstill, when the fact is shown by careful inquiry that the country is using within 10 to 15 per cent. of what it did last year. If one-eighth of the capacity of our iron and steel works could be eliminated, there is no doubt that prices would be buoyant and sellers would be sought.

There is a little ground for hopefulness in the encouraging reports of the condition of general business which come to us from many sources. The iron and steel trades naturally sympathize with other branches of business, and if the latter continue to improve they will exert a beneficial effect on the former. Meanwhile the situation is one of perplexity and uncertainty.

The idea of establishing a Government factory for the construction of guns at the Washington Navy Yard is not likely to be carried out. In fact, the reports thus far received from the Board of Ordnance officers who were sent abroad to inspect the gun factories of other countries—notably Krupp's, at Essen—are such as to give very little encouragement to the plan. The general expectation seems to have been that little, if any, difficulty would be experienced in the work of inspecting these establishments, and that the methods there adopted would be exhibited without hesitation. The board, however, were not long in learning that it is an inflexible rule that foreign military officers shall not be allowed to acquaint themselves with such particulars. At Krupp's works, for example, only a part of the operations are shown, and the erecting shops and projectile department are not open to public inspection. It is more than probable, therefore, that the forthcoming report will be of little importance in advancing Secretary Chandler's idea of a national foundry, and the inspection tour will simply give rise to another item calculated to swell the list of useless Government expenditures.

The question of the value of petroleum for fuel is a very interesting one, and has been a promised field for speculation. In recent discussions on the subject the pros and cons have been pretty clearly gone over. It seems that ordinary coal oil with the exact amount of atmospheric air necessary for perfect combustion will produce 22,700 heat-units with an elevation of temperature of 5484° F., on the supposition that the combustion could take place at this temperature. In combustion with steam, practically the same result as burning in air is obtained. In practice it is calculated that 21,460 heat units will be available, which is equal to the evaporation of 22.21 pounds of water from and at 212° F. With a coal containing 83 per cent. of carbon and 5 per cent. of hydrogen, we have what is equivalent to 13½ pounds of water evaporated from and at 212°. The efficiency of the coal to that of the petroleum is as 1 to 1.64. Allowing for imperfect combustion, &c., it is computed that the actual values are as 1 to 2. At English prices, with coal at 15/ a ton, or, say, $3.75, and petroleum at about 6d., or 12 cents a gallon, it is found that 16 cents worth of coal, or 100 pounds, will equal about 12½ gallons of petroleum costing $1.50 in England. The

actual cost of evaporating a given quantity of water with petroleum, then, will be 4.63 times as much as with coal. In New York City 100 pounds of coal would cost 25 cents, and the 12 gallons of petroleum would cost, say, $1.25, which would make the cost of evaporating a given quantity of water with petroleum five times as much as with coal. In regard to the space occupied by petroleum, mistakes have been made, and in bunkers at sea there will be very little difference between anthracite coal and petroleum.

How to fight fire in the tops of buildings ranging anywhere from 80 to 120 feet is a problem with which the city of New York finds itself face to face, and, unfortunately, without any apparent feasible answer. Fourteen years ago the outline of New York City, seen from the Bay, showed only one or two buildings projecting above the others against the sky. The most noticeable was the then recently completed Equitable Life Insurance Building. Now, from almost any point in the East or North rivers, fifteen or twenty enormous buildings may be seen towering above their neighbors. Many of these buildings are what their names indicate, really fire-proof, having brick and iron floors and being measurably safe from fire. Others, however —and these, perhaps, are not the most lofty —are a perfect wilderness of wooden floors and partitions. When a conflagration is started and the circumstances for its spread are favorable, New York will probably see one of the most tremendous fires that history records. Just now, with a scant water supply and with the most dangerous property situated at a distance from our rivers, it is very difficult to see how the city has escaped so long. Underwriters and firemen are alike turning their eyes to the mechanical engineer, and asking whether some safeguard is not possible which can be applied before the long-promised and much-needed aqueduct is completed.

It is well to have a good deal of science brought to bear on all our modern inventions. In fact, all that we can possibly have will be none too much. The latest criticism on electric light is worthy of serious attention. It is from a doctor, we suppose, as it is credited to the London *Lancet*, which believes the naked electric light is fatal to the eyes, is too hard, "the waves of motion are too short, and the outstroke joins the instroke at too acute an angle." It is now in order for Mr. Brush and Mr. Weston to alter their electric lights so as to make the "waves of motion" longer, and to make the joining of the "outstroke and instroke" form a wider angle. Probably the writer in the *Lancet* sees the point, and perhaps Messrs. Weston and Brush will likewise see the point, but a vague suspicion hovers in our mind that the point the electric-light men see is not exactly the point the *Lancet* man had in mind when writing this stupendous piece of information.

The bisulphide-of-carbon engine is again putting in an appearance in mechanical circles, and we believe a Boston firm is this time trying to work it. We are sorry. Somebody will undoubtedly spend money without getting any return, except from stock speculation, and the stock buyers will be sold in a very unfortunate manner. The enormous pressure which bisulphide of carbon gives at a moderate temperature often deceives even mechanical experts in regard to the feasibility of using it for the production of power. Unfortunately the physical characteristics of the vapor are such as to give no advantage whatever over steam as a fluid for actuating an engine. This disappointing result has been arrived at many times by practical men, and recently one of our leading consulting engineers arrived at the same conclusion from mathematical investigation based on certain known characteristics of the liquid and its vapor.

In his report on the trade and commerce of Venice, Vice-Consul de Zuccato gives many particulars illustrating the remarkable revival in that city of the art industries for which Venice was once so renowned. The most noteworthy are glass manufactures, mosaics, colored enamels, pottery, artistic castings, furniture, lace and the copying of ancient brocades and damasks, recalling the glorious days of the Republic when the Venetian looms produced magnificent stuffs, embroidered with gold, silver or silk, which the Doges sent as gifts to foreign potentates. The art, which was entirely lost, was rediscovered in 1857, and is now recovering some of its ancient splendor. Bead-making alone, which, in spite of all efforts to manufacture this article elsewhere, has always been the special privilege of the Venetians, gives at this time in Venice employment to about 15,000 persons.

As between China and France "the combat thickens." China is moving quietly and with deliberation, as is her wont in all matters pertaining to her internal polity, but she is apparently none the less determined to repudiate the so-called protectorate of Annam. She is well armed with Peabody and Martini-Henry rifles, and France will encounter in the Chinese navy "a foeman worthy of her steel." Aside from large quantities of cartridges sent out from New York City, our local dealers in warlike materials deny that any considerable shipments of arms or ammunition have been made for several years on Chinese account, but this week 400,000 cartridges and 100 cases of firearms, in addition to other material, were sent out by steamer from San Francisco. The French Minister gives notice that all merchandise of this character is contraband.

The Louisville Exhibition.

A correspondent sends us the following interesting notes concerning the exhibition now in progress in Louisville, Ky. :

LOUISVILLE, KY., Sept. 12, 1883.

To the Editor of The Iron Age: The attendance at the exposition for the first month has been fairly good, quite equal to the expectations of the directory and others interested. On September 1, the opening day of the second month, over 20.000 people passed through the turn-stiles. The Louisville ladies were out in full force, dressed in the most delicate and airy costumes. Every village for miles around seems to have turned out for this special occasion. They kept pouring in all the afternoon, when the crowd was augmented in the evening by the business men and mechanics of the city, and yet there was nothing special going on. There was a general feeling abroad that the exposition was not ready and would not be until September, and this may partly account for the great throng on that day.

Expositions nowadays are so numerous that it is difficult to make them interesting. Those who visited the Centennial and were especially interested in industrial art at every turn were sure to come upon something interesting and valuable. This feature of the Centennial Exposition, I am sorry to say, is poorly represented here. It was not to be expected, of course, that the South would be represented by many examples of industrial art of their own design and manufacture, but that so few exhibitors abroad should have taken advantage of this opportunity to show their goods is strange. Lockwood D. Forest, of New York, has a very handsome display of East Indian wood carving and artistic metal work. Williamson Art Metal Works, of this city, have also a fine exhibit of their bronze decorations. These displays are very much admired, but, unfortunately, are very poorly placed; not one in 500 ever sees them. There seem to have been a certain fatality about arranging the display. Cheap dry goods, soda water, cider men and fruit men enjoy the cream. Some of the most interesting exhibits illustrative of Louisville manufacture are consigned to the galleries. Fisher, Leaf & Co. and the Louisville Mantle and Casket Company have both excellent displays of iron and slate mantles, all their own manufacture. Both companies show good taste in getting up their exhibits. The stove trade ought to be better represented. There are only three exhibitors—Terstegge, Gohmann & Co., Bridgeford & Co., and the Lithgow Manufacturing Company. There are some dealers who also exhibit stoves and tinware, but these are the only manufacturers. Terstegge, Gohmann & Co. have a fine show. Strange to say, Bridgeford & Co. are the only stove firm on the lower floor. They have a good exhibit of their specialties, and also of the "Royal Garlands." The combined furniture display is a good one. The work is good, both in design and execution, but the carving is a little heavy. Mersereau, of New York, has a fair exhibit of brass goods. A very elaborate brass bedstead forms the principal attraction.

The lower floor is, of course, the principal part of the exposition, and it will be simply impossible to give any idea of this in one letter. Getting off the main avenue, you come across some exceedingly interesting exhibits. The leather display, an industry that Louisville is proud of, is very fine. One of the most handsome exhibits in the building is McKnight's carpet display. The rugs and carpets and curtains are by far the finest ever seen in the West. This display represents the best that Turkey, Persia or India can produce, and the goods are shown to good advantage in a handsome pavilion. The drug men make quite a good display. Powers & Whiteman and J. B. Wilder & Co. have the principal exhibits. What, of course, is the most interesting, and what this exposition is intended to illustrate, is the resources of the South.

The State exhibits are quite interesting. The Alabama display (exhibited by the Louisville and Nashville Railroad), illustrating the mineral and vegetable products of the State, is thorough. Every species of tree found in the State is shown by cross and longitudinal sections, natural size, with leaf, flower and fruit named scientifically. Botanists will understand how thoroughly this work is done when they know that Dr. Chas. H. Mohr, of Mobile, Ala., had the arrangement of this part of the display. Several specimens of Alabama iron and coal are also shown. Arkansas has a fine exhibit, and Florida is well represented. Kentucky might have been better represented, although Professor Proctor did everything in his power to make a creditable show with the means at his command. The falls of the Ohio have a reputation over all the scientific world as being very rich in certain geological formations, but the directory, thinking there was no money in geology, ignored the local committee. With our facilities we ought to have had one of the best scientific exhibitions, especially in geology, ever seen in this country. The United States Government display, as an educational feature, is good—in fact, could not be better.

The exhibition of agricultural implements are, of course, quite large, and all the principal makers are well represented in this line. The machinery department is also very complete. The woolen, cotton and silk machinery is especially interesting and there is always a crowd of visitors around it. At night, when the whole is illuminated with the electric light, it is undoubtedly very beautiful. The Edison Electric Light Company have the contract for lighting the exhibition. There are 4600 lights in the building, which make everything look as bright as by daylight. The electric railway is another novelty. This is owned by MacGregor Adams, of the Adams & Westlake Company, Chicago. The track is laid around Central Park. The train is composed of an engine and two cars, the large dynamo being placed in the front part. The engine is made after the model of a railroad engine, but any other shape would have done as well. The trip is made in four minutes. Central Park is in itself a beautiful place; it covers about 18 acres and is richly wooded with about 60 species of forest trees, mostly native. These trees are marked with their common and scientific names.

The art gallery is situated at the north end of the park, and it is conceded that the finest collection of paintings ever seen west of the mountains is gathered here. A glance through the art catalogue will convince any art lover of this fact. The American Art Union is well represented by some excellent work. The Art Committee is to be commended for both the display and the arrangement. The statuary, vases, tapestries, bronzes, &c., are most artistically placed. The people of Louisville appreciate the kindness of those gentlemen who have lent their valuable collections for this display, and cordially invite all to come and witness it.

L. E.

Condition of General Manufactures.

Accounts gathered by *Bradstreet's* from all parts of the country respecting the condition of our manufacturing interests are, on the whole, of a very cheering character. After the many doubts and surmises expressed during the tedious days of midsummer, and again suggested by the tardy opening of the autumn trade, it was but natural to indulge in a certain degree of solicitation in regard to the business future. Any apprehensions on this score, it would now appear, may as well be dismissed. The occasional failures here and there throughout the country prove to be sporadic in their character, due either to indiscretion or reckless venture, and do not in any sense indicate the general prevalence of conditions prejudicial to any legitimate transactions. It is true that in some lines---we may specify the manufacture of machinists' tools—there is a dearth of orders not before experienced for several years. The accumulation of orders for months ahead, despite the employment of extra hands, is a circumstance now rarely heard of. But there is now a turn in the trade, apparently, and manufacturers evince more disposition to enlarge their scale of operations. So, too, of merchants handling the products of skilled industry. For one thing, it is known that these classes are more fully employing their resources, as shown by their more frequent applications at the banks with paper for discount. The inference is unavoidable that there are assurances of a more ready market—the foremost impulse given by the ripening crops, in a year of almost unprecedented abundance.

Looking at particular localities, we find that the strongest impetus is found where it would most naturally be expected—in or contiguous to the granaries of the Northwest. There we most frequently find new establishments for the manufacture of agricultural implements starting up; also new foundries and machine shops. Through its correspondents, *Bradstreet's* has received advices from 75 leading points, which we briefly epitomize. At Boston every leading industry is supplied with orders. All classes of ironworkers are busy. Machine shops, boiler works, blacksmiths and nailers are all well employed, though there is a lack of large orders in the two first. The jobbing iron business is quite active. The nail mills are behind orders in several sizes, and their business during the summer has been considerably ahead of last year. At New Haven the volume of business is equal to that of 1881, but not to that of 1882, principally in the medium and better grades of goods. Manufacturers of hardware are generally running on full time. At Albany the production and sale of stoves is somewhat in excess of last fall. Orders are being received daily, and the demand is equal to the supply. Full forces of men are engaged. At Rochester, N. Y., manufacturers of machinery, machinists' tools, and general ironworkers, report trade for the year active, fully as much business being done as last year, with good prices, and the trade has a healthy look. At Syracuse wagon manufacturing is depressed, and in the iron trade most of the furnaces are out of blast. At Utica present indications point to a volume of trade equaling that of the fall of 1881 or 1882. Stove manufacturers are busy, working mainly on orders, which for August were in excess of those in the same month in any preceding year. Other lines are reported to be satisfactory. At Newark, N. J., manufacturers of steam engines and machinery are running at full capacity, and report business very good, some of them having more orders than they can conveniently fill. The leading manufacturers of hardware specialties report this season's business the best they ever had, dealers buying freely, and, as a rule, with plenty of means to pay promptly. The outlook is good, and manufacturers feel very much encouraged.

At Philadelphia machine shops and car works are well employed, with good prospects. The shipyards are fairly busy. The glass works of New Jersey have started up with splendid prospects for fall business, owing to the expected diversion of trade from the West, where production will be largely curtailed by the strike of the window and building glass blowers against a reduction in wages. At Pittsburgh a leading manufacturer of heavy hardware finds trade good, with factories running full. Prospects are considered bright for the winter and spring months. Boiler plate, sheet, bar and nail manufacturers find trade fair to middling. All departments going, some single and some double turn. Prices low and close to cost of production. Some structural-iron manufacturers have orders to the middle of December, and are refusing more. The outlook for the plow manufacturers this fall is not bright. Some of the plow dealers are believed to have booked orders at less than cost. Bolt manufacturers have been damaged by very low prices. At Cincinnati rolling mills have done fully as much as in the preceding year and are now busily engaged, having orders for 60 days ahead. Stove foundries have done better and are running full time, with prospects excellent. At Cleveland, Ohio, the largest steel-rail and wire concern in the West reports business never so poor, in their experience, as this year Orders are few and prospects not encouraging. The stove manufacturing industry is better than last year. Orders are coming in freely, but prices are unsatisfactory, owing to strong competition. The outlook considered excellent. Collections fair. Hardware manufacturers are working on full time, and the trade is fully equal to that of previous years. There are more contracts on hand than ever before for marine engines and machinery. There is no material change in the bolt, nut and tool industry. Business reported very good, but prices are too low to afford satisfactory profits.

At Springfield, Ohio, the cupola furnaces, manufacturers of malleable castings and all kinds of agricultural implements are in excellent shape. At Toledo, architectural-iron works are behind with orders, running full force extra hours. Men of the edge-tool manufacturers are all employed and prospects good, and the engine-builders' business is better by 6 per cent. The mill-machinery manufacturing business is prosperous. The mower and reaper manufacturers are doing a prosperous business, which is increasing. The increase in trade of plow manufacturers is 8 to 10 per cent., and of pump manufacturers 10 per cent.; outlook good. The sewing-machine manufacturing business is increasing and the outlook is encouraging. At Chicago, Ill., in most branches goods are not turned out in advance of orders. The steel-rail mills are producing less than 50 per cent. of their full capacity, and the same may be said of most other manufacturers of railroad-track goods, while car and locomotive materials are in good demand. The bar mills are, with few exceptions, running on full time, and report a good demand for their products. The nail mills have been running on full time since August 17. Manufacturers of engines, pumps, boilers and all classes of iron piping, elevators and hoisting apparatus, say they have sufficient orders to satisfy their productive capacity. Stove founders are all working full time, and a few report an increase of 5 to 10 per cent. At Peoria, Ill., agricultural-implement manufacturing will be on a par with last year, but no increase of trade is looked for. At Springfield, Ill., the outlook is better for all, including the iron industry, than it was one year ago. At Detroit, iron manufacturers are running full and doing a fair business, but with very little profit, though prices are firm. Better things are looked for very soon. Manufacturers consulted, employing from 12,000 to 15,000 persons, anticipate a good, steady, legitimate business for the next four months at least. At Evansville, Ind., foundry men say they are running on full time, with orders ahead. Surely, accepting the foregoing as a faithful portraiture of the present condition of manufacturing, so far as pertains to the hardware and iron industries, there is no reason for complaint.

SCIENTIFIC AND TECHNICAL.

The Effect of Lightning on Trees.

The frequency of thunder storms in Switzerland this summer has afforded Professor Colladon, of Geneva, a great authority on electricity and meteorology, ample opportunity of continuing his observations on the effect of lightning on trees and vegetation generally. He has ascertained that when lightning strikes a tree it leaves very few marks of its passage on the upper part and middle of the trunk, a peculiarity which he ascribes to the fact of those parts being more impregnated with sugar, a good conductor, than the lower part. As the electric fluid descends to the neighborhood of the heavier branches, where there is less saccharine matter, it tears open the bark and in many instances shivers the tree. It is no uncommon thing to find the lower part of a tree literally cut by the lightning, while the upper portion and the higher branches seem to have suffered hardly at all. Oaks, however, would appear to present an exception to this rule, for they are often found with tops quite blasted and the passage of the lightning lower down marked by a gouge-like furrow. These furrows sometimes go completely round the tree like a screw, the reason of which is said to be that the lightning follows the cells of which the bark is composed lengthwise, and in certain sorts of wood these cells are disposed spirally.

Trouvé's Rheostat.

A very useful rheostat devised by M. Trouvé, the well-known Parisian inventor, is described in a recent number of *Engineering*. It consists of a German-silver spring inclosed in a nickel-plated tube, the spirals not being allowed to touch each other, and insulated from the tube by a pasteboard sheathing. Inside the spring is a rubbing contact formed of a metal rod split into four parts, like the split plugs of a resistance box. This rod is graduated in divisions. The current enters at one end of the spring, traverses it, the rubbing contact and the graduated rod. When the rod is deeply inserted into the spiral coil, the current only traverses a few turns, and the resistance in circuit is very small; but when the rod is pulled out the number of turns inserted is considerable. The divisions on the scale tell the number of turns in circuit. The device is employed by Trouvé, in connection with his polyscopes, to regulate the strength of current supplied by a small Planté accumulator. The plan of splitting the rubbing contact is worthy of attention by electricians.

Storm Sounds in Telephones.

A correspondent of *L'Ingenieur Conseil*, signing himself with the initials "E. B.," occupied himself, during a violent thunder storm which occurred at Brussels some months ago, in listening to the storm sounds in a telephonic wire. It was furnished with a good lightning conductor, and, under such circumstances, he is convinced that the experiment was not attended with danger. During the hight of the storm there was a continuous noise, which could only be compared to that of frying. From time to time it would grow louder; sometimes there could be a little popping sound, like a bubble bursting; sometimes the series of crackling noises which follow the fall of a drop of grease on a red-hot iron plate. This last noise came abruptly and loud with each flash of lightning, and seemed to precede it. The observer was satisfied that he could hear the sound before he could see the flash. The same noises were often produced when there was no accompanying flash, but then they were less loud. Their force seemed to have no connection with the peals of thunder. On the 600 lines of telephone wire which focus at Brussels not one apparatus was damaged by the storm, its effects being altogether expended upon the lightning conductors and storm-warning apparatus. This security may encourage other observers to follow the example of "E. B.," who considers that in this manner it is possible to obtain valuable contributions to the study of atmospheric electricity. He is of opinion that the constant noise heard in the wires proves the existence in them of a current of atmospheric electricity flowing into the earth, and that a network of telephonic lines overspreading a town would be its best possible protection against lightning.

Comparative Strength of Minnesota and New England Granites.

Mr. N. H. Winchell, of Minneapolis, Minn., recently had occasion to test the qualities of the building stones of Minnesota, and the results obtained are interesting in many respects. Mr. Winchell subjected the stones to the usual tests of crushing, and used for this purpose specimens consisting of 2-inch cubes. These specimens included sandstones, limestones, granites and trap rocks to the number of about 100. Great care was taken in preparing them, and they were sent to General Gilmore, at Staten Island, and there subjected to the tests, which were applied by crushing the samples, one in the direction of the schistose structure and one across it. Taking the average of the results of 20 samples of Minnesota granites, it appears that the strength of a cubic inch was equal to 26,675 pounds. Allowing 11 per cent. difference between the process of crushing between steel plates and wooden cushions, this gives an average for Minnesota granites of 23,318 pounds. Testing New England granites gave for the average of 20 specimens a strength per cubic inch of 14,946 pounds. After discussing several probable sources of error, Mr. Winchell suggested causes why the Minnesota granites may be stronger than those of New England, and among other things stated that those of the Western regions may have been less changed by decay. The lateness of the glaciation to which they were exposed may have left them comparatively fresh through the recent removal of a considerable thickness.

The Temperature of Tunnels.

A Geneva correspondent of the London *Times* remarks that at the instance of the Simplon Railway Company a commission of experts have compiled and published an interesting memoir of the geological condition of the Simplon, with special reference to the temperature of the proposed tunnel. The temperature of a tunnel depends chiefly on its length, character of the strata through which it runs and the thickness of the superincumbent mass. In the St. Gothard Tunnel the temperature often rises to nearly 90° F. In the proposed Mont Blanc Tunnel it will probably be about 120° F., and in the Simplon Tunnel, if the trace projected in the year 1877, which passes through Mont Leone, were adopted, might be about 118° F. It is now proposed, however, to adopt another line of operation, which, though it would be a curve and would make the tunnel considerably longer than was contemplated, offers several important advantages as compared with a straight line. It is estimated that the normal temperature of the tunnel on this line would not exceed 95° F., and as the nature of the ground would admit of the sinking of two shafts the temperature might be considerably reduced.

A Chemical Photometer.

Mr. Antony Guyard, of Paris, has recently proposed a photometer which is based on a well-known chemical operation, and is decidedly interesting. When iodide of nitrogen is placed in water it decomposes under the influence of light. In aqueous ammonia the decomposition is effected more regularly, and iodide and iodate of ammonia are formed, the rapidity of decomposition being proportional to the intensity of the light. The volume of nitrogen evolved in a given time is therefore a measure of the radiation. Mr. Guyard's apparatus consists of a test tube having its neck hermetically closed by a cork divided into centimeters and tenths. A lateral tube communicates with it, like the lurette of Gay-Lussac. Into this test tube the inventor places about 1¼ grams of the iodide, then adding ammonia at 22° until it is filled. The tube is then tightly closed, excluding air bubbles, and is exposed to the light. The liberated nitrogen accumulates in the neck of the tube, and to take a reading the lateral tube is emptied until the level in both tubes is the same. The quantity of iodide—1¼ grams—liberates about 33½ cubic centimeters of nitrogen. Mr. Guyard prepares nitrogen and iodate of ammonia in this way by allowing the light of an electric arc lamp to fall on the mixture of ammonia and iodide of nitrogen in the dark.

Condition of the Air in Theaters.

Some interesting experiments have recently been made in Germany relative to the temperature and condition of the air in theaters when lighted by electricity and gas respectively. The investigations at the Residenz Theater, at Munich, showed that the increase of temperature was 10 times as great in the upper gallery when gas was used than when illuminated by electricity. In the former case the temperature rose about 16½° F. and in the latter only 1.6°. In the lower portion of the house there was naturally a less marked difference. With a full house the temperatures with gas and electricity were 84° and 73° respectively. The temperature was not as high in the third balcony with the electric light as in the first with the gas lights. The amount of carbonic acid was also determined, and it appears that with an empty house, where all the carbonic acid came from the lamps, there was the same difference as in temperature. At the beginning there were about 4 parts in 10,000 in the auditorium. With gas lights this increased to 5 parts in the pit in about half an hour, to 11 parts in the first balcony and 20 in the third. With electricity it was 4 parts at the beginning, and in half an hour 5 in the pit, 5 in the first balcony and 6 in the third balcony. With 500 or 600 people in the house the maximum amount of carbonic acid was 23 parts in 10,000 with gas lights, and 18 in 10,000 with electric lights. A number of reasons, however, may be given as tending to produce inaccurate results, and consequently these

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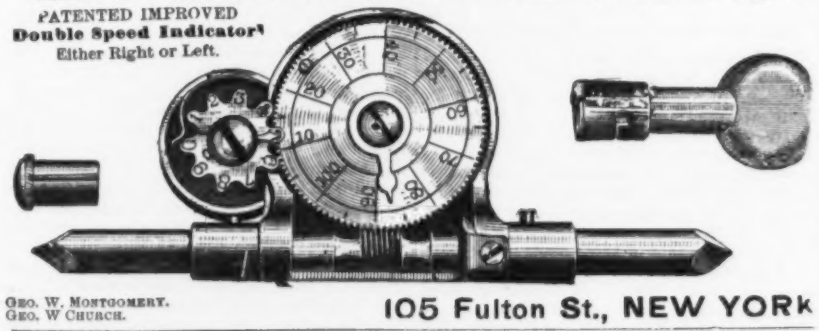

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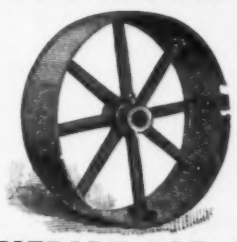

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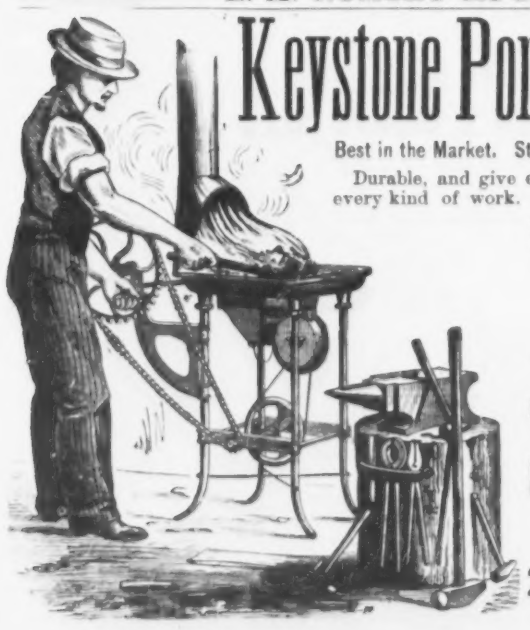

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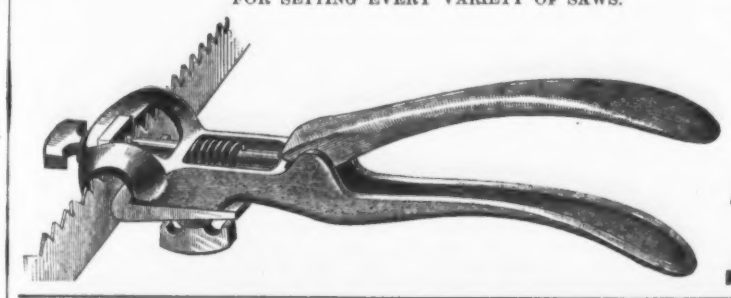

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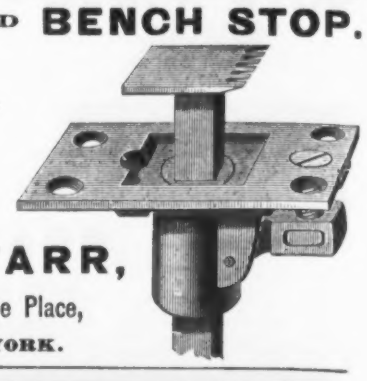

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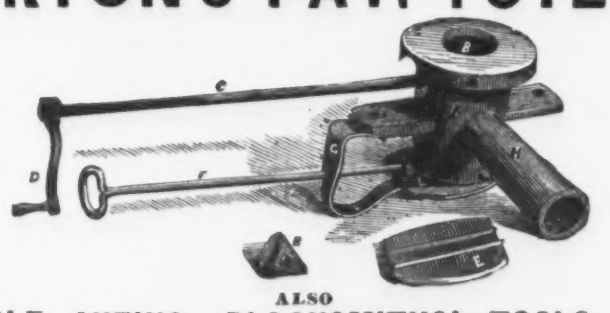

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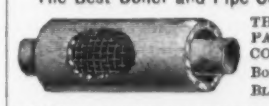

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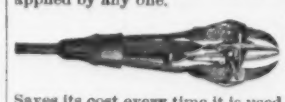

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figures cannot be looked upon as absolutely correct. So far as the temperatures are concerned, the results obtained may undoubtedly be accepted as fairly representing the condition of things when using the two different lights, and point strongly in favor of the use of electric illumination.

Earthquakes and Outbursts of Gas in Mines.

The recent disastrous earthquake near Naples has renewed the discussion of the probable cause of these upheavals of the upper crust of the earth. As described in a British exchange, the terrestrial crust reposes on lava, in all probability, of a declining temperature, and the solid portions formed at the surface of the crust internally are moved upward by masses of a high temperature, tending by fusion to diminish the thickness of the crust in certain places, thus producing eruptions. A similar cause and effect is stated to result from sudden outbursts of gas in coal mines, and a British mining engineer of some eminence, who has paid a good deal of attention to these phenomena, records several sudden outbursts of gas which forced up the floors of mines and continued blowing off for weeks without intermission. At one colliery the pressure, as stated, amounted to 135 pounds to the square inch. This is analogous to the effect of an earthquake, but, of course, on a much smaller scale. In other ways, also, there is a similarity between outbursts of gas in mines and earthquakes, more especially as regards premonitory warnings. It is a fact frequently recorded that outbursts of gas in mines are preceded by a trembling of the earth. From these circumstances conclusions may be drawn favoring the opinion that earthquakes proceed from something like the same cause as these outbursts in mines, being the pressure of pent-up gases in the earth.

The Outlook for Wheat Exports.

As bearing on the probable extent of the foreign demand for our wheat surplus, the following facts from the New York *Produce Exchange Weekly* will be read with interest:

The world's supply of wheat and the world's wants for wheat can, at the best, be only approximately estimated. The annual report of the Produce Exchange for 1882 contains official reports of the wheat nearly all the countries of the world have imported and exported for a period of 10 years. An average of these annual reports for ten years is made the basis for an estimate of the probable wants and the probable supplies of wheat for the cereal year 1883-84. It is too early in the season to make a final estimate. The world's wheat crop for 1883 may not have been determined with sufficient accuracy to warrant such an estimate. The crop of the United States is for 1883 a short one, but how much is the deficiency? The Department of Agriculture makes a preliminary statement of a probable deficiency, when compared with the crop of 1882, of 86,000,000 bushels. The reports from the State Departments of Agriculture, given herewith, make a deficiency in seven States and one Territory of 113,500,000 bushels. The spring wheat crop of 1883 is expected to be larger than that of 1882. The estimates of the deficiency of the wheat crop of 1883 in the United States, compared with the crop of 1882, range from 86,000,000 to 120,000,000 bushels. There was a surplus left from the crop of 1882. The estimates of this surplus are variable. The more generally received opinion is that the exportable surplus from the crop of 1883, plus the reserves of the 1882 crop, will be nearly equal to the actual exports for the crop year 1882-83 ended June 30. The aggregate of such net export, including wheat and wheat flour, was equal to 146,724,305 bushels *vs.* 121,026,922 bushels in 1881-82. The gross exports of wheat and flour from 16 principal ports were equal for the year ended June 30:

From—	1882-83.	1881-82.
Pacific ports	32,799,617	46,315,170
Atlantic ports	112,564,565	72,147,437
Total bushels	145,364,182	118,462,613

The exports from the United States to other countries than Europe usually range from about 16,500,000 to 18,500,000 bushels of wheat. It will probably be considerably more than this in this cereal year, as there is a deficiency in the crop of the Dominion to be supplied. The Oregon crop is reported to be one-third short of 1882 crop. The California crop, by recent reports, is disappointing, and largely below the early estimates, the export surplus now being reckoned at no more than 30,000,000 bushels.

In making the following preliminary estimate, the wants are made on a conservative basis and the supplies on a liberal basis, as seen from the present outlook:

PROBABLE REQUIREMENTS AND SUPPLIES.

	Probable wants of Europe 1883-84. Bushels.
United Kingdom	145,000,000
France	75,000,000
Belgium	18,000,000
Holland	10,000,000
Sweden	1,000,000
German Empire	18,000,000
Switzerland	10,000,000
Spain and Portugal	8,000,000
Italy (possibly much more)	20,000,000
Greece and Mediterranean	8,000,000
Total	313,000,000

PROBABLE AVAILABLE SUPPLIES FOR EUROPE.

From North America—both coasts	115,000,000	
From Chili	3,500,000	
" Australia and New Zealand	6,000,000	
From British India	35,000,000	
" Egypt	500,000	
" French Algeria	1,000,000	
" Austro-Hungary and Danube	12,000,000	
From Turkey	1,000,000	
" Russia	55,000,000	232,000,000
Deficiency on this estimate		81,000,000

The supplies of the United Kingdom have been, crop years ended with August, for last three years:

	1882-83.	1881-82.	1880-81.
Gross imports, bu.	161,863,032	177,304,848	134,702,108
Domestic wheat "	72,244,800	58,484,464	52,978,368
Total bushels	214,107,832	195,789,312	186,680,476

The wheat crop of the United Kingdom in 1883 is estimated to give an output of 60,000,000 bushels for food of her population.

France in 1882 had a wheat crop of 343,000,000 bushels of 60 pounds, and imported net during the crop year ended July 31, 1883, equal in wheat and flour to 45,280,377, against 47,429,881 bushels for the corresponding period in 1881-82. The crop of France in 1883 is estimated at 90,000,000 to 100,000,000 bushels less than her crop of 1882.

British India's largest export to Europe has not exceeded 35,000,000 bushels. With prospects for bad crops in the Punjab, the most important wheat growing district in India, the exports of 1883-84 may be considerably less than 35,000,000 bushels. The largest movement of wheat from British India is in the first half of her crop year beginning April 1.

The supply from Australia for Europe, if there shall be a good crop harvested in December and January next, may be larger than the estimate.

The average Russian export for 10 years has been about 59,000,000 bushels of wheat. With 7,000,000 acres winter wheat ruined by winter kill, it is not probable that her spring wheat crop will give a surplus for export to exceed 55,000,000 bushels.

The reported damage and deficiency of the rye crop of Europe, which is from 1,100,000,000 to 1,200,000,000 bushels annually, may have an important bearing on the consumption of wheat.

TRADE PUBLICATIONS.

Pratt & Whitney Co., Hartford, Conn.

The illustrated catalogue and price list of the Pratt & Whitney Co., of Hartford, Conn., is just at hand. As might be expected, it is full of things new, good and interesting. In running through it we are almost tempted to make a catalogue of the leading and more interesting tools and machines, but after going through the 190 pages a second time we see that the list would be altogether too large for the columns of a newspaper. In fact, it would be merely a condensation of the catalogue itself. The book is convenient in shape, well printed, with good engravings and sensible and well-written letter-press. The departments of lathe tools and screw-cutting tools and machinery are very complete and well represented, and there are many new illustrations. Gauges, standards, limit gauges, &c., are well represented, and many new and very useful forms are shown. Quite a number of novel tools are illustrated, as well as most of the standards with which our readers are familiar. A full line of milling machines of all sizes, as well as drills and planers, are shown and described. The catalogue is one which will prove very useful.

Machinery, Tools and Supplies.

Jackson & Tyler, of Howard street, Baltimore, Md., send a very complete illustrated catalogue of machinery, tools and supplies for railways, machinists and mills. The catalogue embraces a very full line of tools, including lathes, planers, gear cutters, gear-cutting attachments, shapers and slotting machines, as well as drill presses in almost numberless variety. In chucks, drills, reamers, lathe dogs, &c., it is equally complete. The department devoted to blacksmiths' tools, forges, barrows, &c., together with that of steam-fitter's tools, is large, and, in fact, every branch is well represented. The firm, in addition to a full line of goods of all the leading manufacturers, have a manufacturing department of their own and make special machinery of all descriptions to order. Prices are attached in most cases, which is, of course, a convenience to the customer, who is able to see at a glance the size, style and price without the necessity of referring to a price list.

Steam Fittings.

The Walworth Mfg. Company, Boston, of 69 Kilby street, have issued a catalogue which contains almost everything in the line of cast-iron and wrought-iron radiators, steam and gas fittings, brass and iron valves, cocks, steam and gas fitters' supplies and steam and hot-water apparatus of all kinds. Running through the pages, it would seem that almost every imaginable tool was represented, from a washing machine to a ventilator, and from a hydraulic jack to an automatic fire extinguisher. The book is a very handy one, well arranged and furnished with a very comprehensive index.

Another Barbed Wire Suit.—The Washburn & Moen Mfg. Company have filed a petition for a writ of injunction against the Lyman Mfg. Company, of Chicago, in the United States Circuit Court. The company represent that they are the sole owners of patents for making barb wire, and as such owners they licensed the Chicago company in January, 1881, to manufacture barb wire not to exceed in quantity 2500 tons a year, or to employ therein more than 22 barb-wire machines. But, instead of sticking to this agreement, the Lyman Company have, since January 1, 1883, already manufactured 3100 tons, being in eight months 600 tons more than they are entitled to make in a whole year, and are yet hard at work making more. The Washburn & Moen Company ask for $100,000 damages and an injunction restraining the company from making more than 2500 tons a year hereafter. The reason offered why this should be done is that the price of barb wire may not be lessened by overproduction, and that the monopoly of the patentees may not be disturbed.

The Congress of Commerce and Industry began its annual session at Amsterdam on September 14. A resolution was adopted declaring that the principal cause of the depreciation of silver results from the decrease of its coinage in Europe. The resolution also expresses a wish for the adoption of a common double standard throughout Europe and America.

The agitation concerning the smoke question is still being vigorously carried on in Chicago. Quite recently the Chicago and Northwestern Railroad Company were fined $250 on the evidence that five of their switching engines were seen emitting dense clouds of smoke. The crusade of city officials is particularly directed against the railway companies and owners of river tugs.

The Railroads of Venezuela.

Consul H. N. Beach, writing from Puerto Cabello, Venezuela, under date of Feb. 8, remarks that the first railroad built and operated in Venezuela began at Puerto Cabello and led to the westward, along the strip of land between the Bay of Trieste (the bay is an extension of the Caribbean Sea) and one of the Andean ranges, which varies from one mile to two miles in width. This strip of land is a joint formation produced by a wash-down from the mountains and a wash-up from the sea, and is nearly dead level. When the road was projected it was with the intention and expectation that it would be extended for a distance of about 70 miles, and in its course to reach one or two interior cities. From the levelness of the route and the sandy character of the soil the work of grading was neither difficult nor expensive. About 10 miles of the road were put into operation and kept in operation for a few months. Financial embarrassment followed, the cars stopped running, the rails were taken up and shipped away, and now nothing visible remains of the enterprise but an outline view of the nearly jungle-overgrown road-bed.

Tucacas is about 30 miles to the westward of Puerto Cabello. From Tucacas to the mines of Aroa, where copper mining is prosecuted, the course is southwesterly, and distance 55½ miles. Between these places an English company, about the year 1870, built a 2-foot gauge railroad, mainly for use in connection with mining. The topography of the country permitted the road to be built in almost an air line, it having but few slight divergencies. The obstacles met with in its construction were many, and some very formidable. For a large portion of the way there were trees of great size, and a dense jungle from 20 to 30 feet in hight. From the nature of the obstacles it became necessary that the building and surveying of the road should be conducted in conjuction, and the line of the road was sometimes determined by the compass following those who cleared a place for the track. A great deal of malaria abounded; poisonous reptiles were frequently met with, and tigers and other wild animals were quite numerous. The fertile soil was full of roots, rendering the grading of the road very difficult. A few small streams were crossed, the largest requiring a bridge of 90-foot span. The bridges are iron structures, the railroad ties are of iron, and even the telegraph poles along the line are of the same material.

The road appears to be substantially constructed, and the cars run very smoothly. For 23 miles from Tucacas the grade of the road has made an ascent of 150 feet. Near the western terminus of the road the mountain is approached, and at the distance of 50 miles from Tucacas the elevation is 700 feet. The road for its last five miles has an upward grade of 600 feet, requiring especially-constructed engines for the movement of trains. There are nine stations on the road—all mere stations, except Tucacas, the starting point, with a population of 1200, and La Luz, the practical terminus for general business, 50½ miles from Tucacas, a village having a population of about 3000. The freight cars carry from five to six tons and the passenger cars about 30 passengers. Of late years the road has, in addition to the copper ore, freighted considerable coffee and other general merchandise of the country, coming mainly from Barquisimeto, a city of 29,000 population, 60 miles beyond La Luz, with which it is connected by a coach and cart road. The passenger business of the road is very light.

A railroad from La Guira to Caracas has been in process of construction for several years. The distance by a foot-path over the intervening mountain is eight miles, but by the necessarily circuitous route of the railroad line it is 22 miles. Caracas is 2600 feet above the sea at La Guira; but in passing over the lowest point of the intermediate mountain an altitude of 3000 feet is attained, from which there is a descent both ways. The track of the road is 3½-foot gauge. The grade over the mountain is uniform 3½ per cent. The road is built on a series of reverse curves, having a radius of 140 feet. Caracas is directly south of La Guira. In starting from La Guira the course of the road is westward, but it circles around to the southward in ascending the mountain, and the whole forms a large semi-circle as it reaches its southern terminus. In building the road work was begun at La Guira, and has been progressed from that point. The northern end of the road has been completed for over a year, and is utilized for the transportation of material used in its construction. In recently riding over the coach road between the cities named, which for much of the way is near the railroad line, Consul Beach was enabled to observe the work as fully completed and as incomplete.

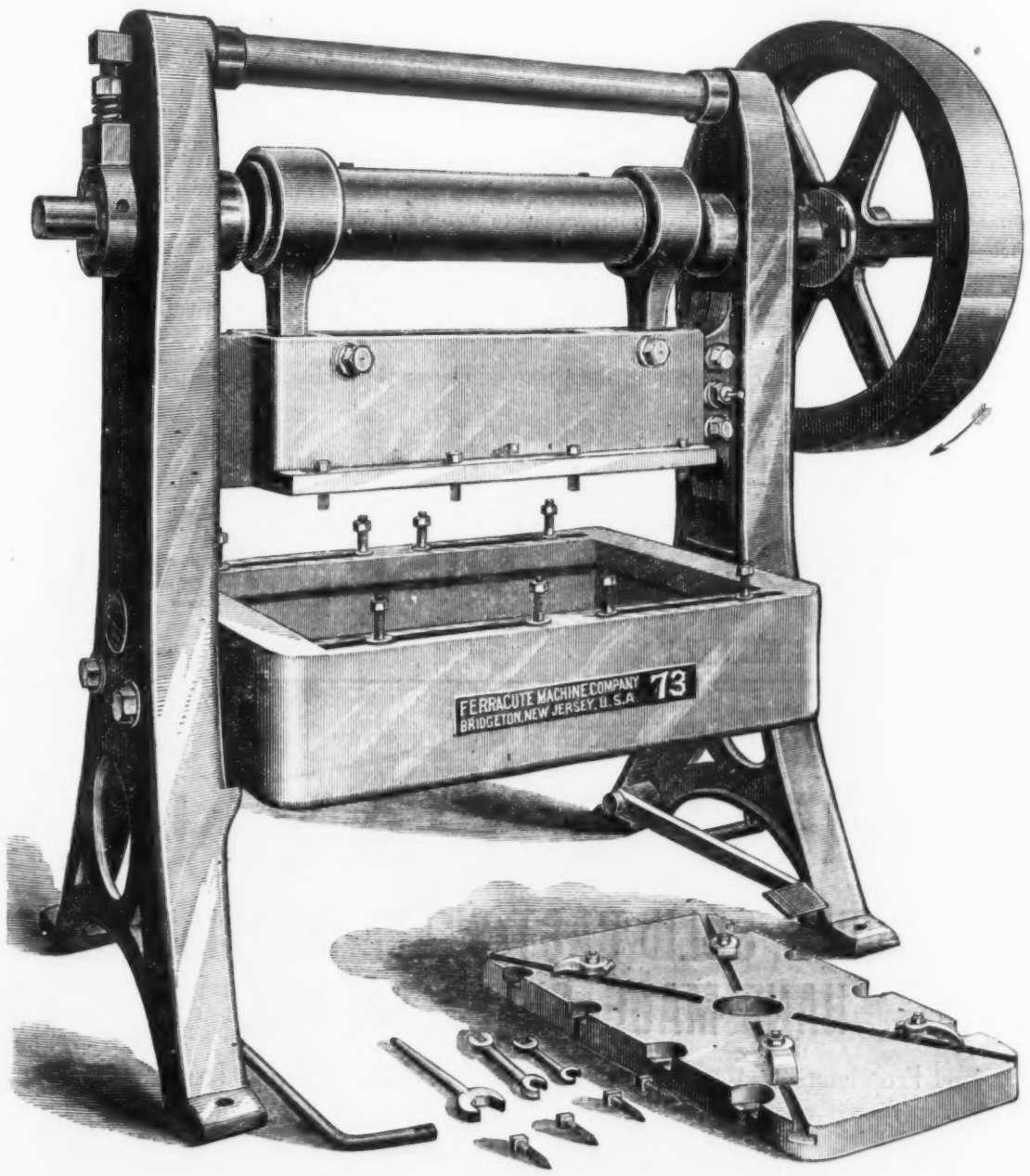
Great scientific skill has been displayed in the engineering. The work is well executed, and, judging from the large force of men employed, the road will doubtless be in running order its entire length by the 1st of July next, the time of opening fixed by its managers, and which is the time set for opening the International Exhibition at Caracas—both openings to be celebrated in conjunction. For a considerable part of the way the road passes along the precipitous sides of the mountain, having a surface of earth and shale rock which is liable to be carried in large quantities on to the track by heavy rain showers, and which will be the greatest obstacle the operating of the road will have to contend against.

Surveys have been made for other railroad lines, and a small amount of grading has been done on a proposed road between Puerto Cabello and Valencia, a distance of about 40 miles, with intermediate mountain elevation of 1800 feet.

One of the greatest drawbacks to the extension of the coal trade in Russia is said to be the high charge for railway transportation and the want of proper roads to serve as feeders to the different lines. Inquiries instituted many years ago as to the working of Russian railways showed that for analogous national traffic the rates in Russia were double the current rates in France, Belgium, Germany and Great Britain. Inland water transportation naturally suggests itself as the cheapest method for conveying coal from one part of the country to the other. Unfortunately, however, the Government has neglected the waterways, thus preventing the inhabitants from availing themselves of the natural advantages which Russia possesses in so large a degree.

Double-Crank Power Presses.

Presses which are designed for cutting or forming the large sheet-metal blanks used in the manufacture of the largest pieced tinware, tea-trays, coal-hods, &c., necessarily occupy more floor space and require more special features in their construction than the presses which are limited to work of small diameter. In single-crank presses the point where the pressure is applied usually lies in the center of the surface bounded by the cutting or forming edges of the dies, the slide-bar being guided by slide bearings. On the length of these slides, as well as the manner in which they are fitted together, depend the accuracy of the descending stroke. It is evident that in single-crank presses the length of the slides should be in proportion to the diameter of the work, but as a very large diameter would necessitate a correspondingly high press, it soon becomes necessary for the sake of economy to change the construction of the machine, which is usually done by causing the pressure to be transferred from crank-shaft to slide-bar at two or more points instead of one. These points should be as near the slide bearings as possible, and the adjustment of the bar should be of such a character as to affect the several pitmans simultaneously.



Double-Crank Power Press.—By the Ferracute Machine Company.

The double-crank press illustrated is of recent design, and contains the principal modern improvements in this line. The engraving represents one of a series of six sizes (numbered from 71 to 76), built by the Ferracute Machine Company, of Bridgeton, N. J., and is an exact representation—being engraved from a photograph—of press 73. These presses are built with heavy solid columns and bed, and the two eccentrics are made in one casting, forming a truss which prevents the shaft from springing. The adjustment of the slide-bar is regulated by means of an eccentric sleeve working in both pitmans, thus insuring an accuracy that cannot be obtained where they are adjusted separately. Special bolster plates, provided with die clamps (shown in the cut), are made to order to suit small dies. These presses have the automatic clutch, spring brake, clamped gibs, safety pins, and most of the improvements peculiar to the other presses manufactured by this company.

The weight of press 73, without bolster plate, is about 4400 pounds; width between columns, clear, 44 inches; hight to slide-bar, when up, 9 inches; stroke of slide-bar, 1½ inches; adjustment of slide-bar, 1 inch; diameter of fly-wheel, 39 inches; width of fly-wheel, 6 inches; weight of fly-wheel, about 750 pounds; extreme hight of press, from floor to highest part, 6 feet 3 inches; extreme depth, front to back, 3 feet 3 inches; extreme width, right to left, 5 feet 8 inches. The hole through the bed is of rectangular shape, and measures 24 x 36 inches, the size of the hole in press 71, the smallest of the series, being 16 x 24 inches, and that in press 76, the largest, 36 x 54 inches. This press is especially adapted for cutting out large articles in tin, brass, copper, sheet iron, &c., such as boiler covers and bottoms, stove boards, stove-pipe elbows, sections of buckets and tanks, tin signs, &c., and also for forming and corrugating any large sheet-metal work.

The Iron and Coal Trades of Scotland.

In a recent issue of our British contemporary, the *Colliery Guardian*, we find an interesting review of the iron and coal trades of Scotland, from which it appears that the Scotch pig-iron trade is just now passing through a peculiar phase of its history.

"At no time," says our contemporary, "has there been a more extensive legitimate business done. The output is very large—more so, indeed, than even the number of furnaces in operation would seem to indicate, for within the past few years a large proportion of them have been remodeled and improved in such a way as to greatly increase their capacity. Both at home and abroad the consumption of Scotch pigs has been considerably above the average. Still, the prices rule very low, and particularly in the case of the warrant market a feeling of great depression prevails. During the greater part of the past month warrants have fluctuated only a few pence per ton, and there has been positively no inducement to turn over the iron from one set of hands to another. At the beginning of the month considerable purchases were made by merchants who were apprehensive that they might be called upon to make deliveries at a time when rates would be higher. But it was presently seen that the movement among the miners, which was looked upon as the lever by which prices were to be raised, was likely, for some time at least, to prove a failure. Over all the mining districts, with the exception of Fife and Clackmannan, the miners are completely disorganized, and the meetings that were held early in the month of August to agitate for an increase of wages were very poorly attended. It was apparent that the men were destitute of competent leaders, that they were indisposed to combine or adopt any course that might end in a strike; and this being evident, the warrant market sunk into a state of complete lethargy, and prices went back to a lower figure than they had been at for weeks.

"The month opened with 115 furnaces in operation, one was afterward put out and two subsequently lighted, so that there are now 116 blowing, producing an average of 200 tons of pig iron each per week. At the same date last year the production was about 1200 tons a week less. In the warrant stores, the stocks exhibit a slight increase since we last wrote on the subject, but they are 45,000 tons below the figures at the end of August, 1882. The general impression among those best informed, however, is that the quantity of pig iron held by makers in their own yards has of late been augmented. The fact is that, although the miners have not as yet obtained a general advance of pay, following upon the recent increase in the price of coal, their wages have been gradually creeping up from natural causes all through the season, and as they may probably become higher still, it is to the advantage of the ironmaster that he should produce as much iron as he can at present. With augmented cost of labor and dearer fuel, the ex ense of making pig iron is now about 2/ per ton more than at this time last year. We have already remarked that home consumption and exports are both extensive. Several weeks ago the latter seemed to be shrinking, but they have since been exceptionally good, showing a considerable increase. At the same time, not a few merchants and makers are apprehensive as to the future. The fact is that it is not easy always to go on shipping larger quantities than at any former time, and they know that in the event of a comparative decrease occurring it is almost certain to exercise an adverse influence on the market.

"The trade with the United States is particularly a source of uneasiness. Merchants do not put any faith in it. This is unfortunate, seeing that, next to the quantity of pig iron used at home, comes that dispatched to the States. The shipments thither during August have been about 11,000 tons; but, judging from the orders placed for future delivery, the quantity to be sent in September will not be so large. Of course, the ironmasters may have private orders of which they say nothing, but this is regarded as highly improbable. In the course of the month Canada has taken upward of 7000 tons of Scotch pigs, Germany nearly 9000, Italy 4000, Russia 3800, Holland 2500, and France 2000 tons. Our ironmakers are again using rather less Cleveland pig iron, but the demand for it still continues above the average, and the arrivals to date show a comparative increase of 24,000 tons. A large quantity of hematite is being consumed, and as it is very moderate in price, the cost of steel goods is thereby cheapened and the demand for them extended. The manufactured iron and steel trades are quite as busy as at any previous time this year, and it is satisfactory to observe that their prospects appear to be improving rather than otherwise. Shipbuilders have booked many good contracts that will serve to extend the period of activity and give additional work in the foundries and malleable and engineering establishments. Business in the manufacturing departments is, on the whole, in a favorable condition.

"It will be inferred from what has been said above that the coal trade has been expected to yield considerable stimulus to the iron market. Although it has not hitherto done so, it would be a mistake to conclude that the coal trade itself has not improved materially in the period under review. All parties, sellers and consumers alike, admit that for shipping and manufacturing purposes an advance of 6d. to 8d. per ton has been made perfectly good, and that it is paid in most quarters with scarcely a grumble. The current demand for coals of nearly all qualities is brisk. The shipments of the month from the various Scotch ports give a total of about 315,000 tons, being 55,000 tons more than in April, 1882, and the quantity used at home has of late been greatly on the increase. Whether the prices will rise higher presently depends upon the pressure for supplies toward the end of autumn. The miners are apathetic, chiefly because they are, comparatively speaking, in a prosperous position. There has been a scarcity of men for both coal and ironstone mining, the consequence being that masters have for months past been competing for their services by offering them a few pence additional wages per day. By this means the men's remuneration has been gradually improving, and, with steady employment, they find themselves in tolerably easy circumstances. Past experiences, of a bitter kind, make them exceedingly shy of adopting an attitude of hostility to their employers, and the agitation for better wages is therefore carried on with much caution, and only participated in by a section of the miners."

The Corn Crop.

It is now generally believed that the first reports concerning the effect of the late frosts upon the corn crop were exaggerated. An average corn crop is worth about $800,000,000. If it were possible for a frost to destroy the crop entirely in five States, the loss would be about 800,000,000 bushels, or half the whole crop. But these States, reaching from the Ohio line to the western border of Kansas, from the Arkansas line northward to Minnesota, cover so vast a territory that injury from such a cause can hardly reach one-half of the corn there produced. Indiana produced 107,500,000 bushels last year, and Illinois 182,300,000, and a large part of the corn produced by each is in the southern portion, below the point which recent frosts are said to have reached. Missouri, yielding last year 170,000,000 bushels, is also almost wholly below the line said to have been reached, as is Kansas, which produced 144,500,000 bushels. In fact, of the five great corn-growing States, Iowa is the only one which lies mainly north of that line, and its yield, 175,500,000 bushels last year, is reported to be injured only in some localities. Assuming that the northern half of Indiana and Illinois, with less than 140,000,000 bushels, and the whole of Iowa, may have been to some extent affected, the injury may cover some part of 315,000,000 bushels, out of nearly 800,000,000 bushels grown in the five great States.

North of these are States which produce in all only one-tenth of the entire corn crop. These are Michigan, Wisconsin, Minnesota and Nebraska, which produced last year 164,300,000 bushels. Adding the 4,000,000 bushels grown in Dakota, Oregon and the intermediate Northern Territories, with Iowa and the northern part of Indiana and Illinois, we have in all 485,000,000 bushels grown in the regions which may have been affected by the recent frosts, and it is not supposed that even within that region more than a fraction of the crop has been harmed. The alarm which some speculators raised at Chicago, therefore, does not seem to have had much foundation. Even if 200,000,000 bushels should prove to be lost by reason of the frost in the whole of this northern belt, it would not be a very serious matter, in view of the fact that the entire crop of this year was expected to exceed that of 1882 by about 400,000,000 bushels. There would still remain more corn than the country has ever yet found use for in any year. Hence, although the statements as to damage are conflicting, at the worst the injury yet done can hardly leave the country with a crop as small as the largest ever grown before, if the estimates generally received prior to the cold snap were not far from the truth.

Below the line indicated, in Missouri, Kansas and the southern half of Illinois and Indiana, corn was well out of danger before the frost occurred. In a few scattered localities where it was necessary to plant a second time, growing corn in low ground may have been injured, but this cannot amount to much in comparison with the entire crop. In all the Southern States and Territories, also, the crop was out of harm's way. The Southern States produced 480,600,000 bushels last year, and California, Colorado and the Southern Territories 4,500,000 bushels. The increase in yield at the South is said by the Bureau reports to be very large. Ohio, Pennsylvania, New York, New Jersey and the New England States produced last year 174,300,000 bushels, of which 93,300,000 were from Ohio alone, and it is not reported that the injury in these States has been of importance. In short, the question is as to the region in which about 500,000,000 bushels were raised last year, out of 1,617,000,000 bushels in all. It does not yet seem probable that the injury in that region will equal the reported increase elsewhere. In examining the possible consequences of a great cold wave, one is struck with the comparative security which the vast territory of this country gives against disasters to agriculture. The causes that bring about misfortune in Minnesota and Wisconsin can hardly affect the central belt, in which crops mature some weeks earlier, and still less can they affect the Sunny South. Nor can it often happen that any destructive change of temperature can sweep over the 1500 miles between Western Kansas and the Atlantic Coast without losing much of its force. Even the terrible drought of 1881, which prevailed for months over a wonderful expanse of country, only reduced the yield of corn to 1,200,000,000 bushels, and this was more than had ever been raised in any year prior to 1875. In any single locality the farmers are exposed to losses, but the nation has a security against great calamity in the vast extent of its cultivated territory and the wide variations of climate under which cultivation is prosecuted.

Reaper Companies at War.—A dispatch from Milwaukee, under date of the 13th, says: The answer in the case of D. M. Osborne & Co., of Auburn, N. Y., against George and G. W. Esterly, father and son, doing business under the firm name of Geo. Esterly & Son, at Whitewater, Wis., manufacturers of the Esterly reaper and mower, was filed in the United States Court to-day. It will be remembered that the Osbornes lately sued the Esterlys for libel, claiming damages in the sum of $150,000, and alleging that they had issued circulars and made statements concerning the Osborne machines that were malicious and false, damaging their business to the amount stated. The answer is very long, covering many pages of closely printed legal cap. All of the allegations in the complaint are emphatically denied, and counter charges are made against the plaintiffs. Stripped of its legal verbiage, the answer claims that the Esterly binder is the original invention, embodying all the devices in dispute; that D. M. Osborne & Co., seeing that their machines were becoming unsaleable on account of the superiority of the Esterly machines, applied the principle identically to their own harvesters, to the great disadvantage of the defendants; that after applying the principle they first sold the machine under the name of the

Esterly, and then changed it to the Osborne. It is alleged that the Osborne people circulated reports that they had foreclosed and obtained possession of the property of the Esterlys, which statement was malicious and false, and did great injury to the defendants. The answer closes by demanding the dismissal of the plaintiff's action and judgment against the defendants for damages in the sum of $500,000, besides all costs of the action. J. H. Page and W. F. Vielas appear as the defendants' lawyers. The suit is one of the most important ever recorded in the local courts, and the outcome will be eagerly watched.

Iron and Steel Shipbuilding on the Delaware.

According to the Philadelphia *Press*, the iron and steel shipbuilding industry of the Delaware River has had a wonderful development since the opening of the present year. The expansion of the trade has been without precedent. In this respect the Delaware River bears the same relation to the other shipbuilding centers as the jug to the handle. The proportionate amount of business done elsewhere in this country is insignificant. The business done during the first six months of 1883 is greater than the entire bulk of the transactions for 1882. The river is, indeed, the Clyde of America. The following table will show the tonnage of the iron and steel ships built in this country from 1868 to 1883:

Years.	No.	Tonnage.	Years.	No.	Tonnage.
1868	....	2,802	1876	25	21,346
1869	....	4,584	1877	7	5,926
1870	....	8,281	1878	32	26,960
1871	....	15,479	1879	24	22,008
1872	20	12,766	1880	31	25,582
1873	26	26,548	1881	42	28,356
1874	23	33,097	1882	43	40,097
1875	20	21,632			

During the last six months of 1882 there were built at New York, Philadelphia and Wilmington 14 vessels, having a displacement of 13,792.48 tons, and an approximate weight of iron in hulls of 10,000 tons. These figures were compiled by Assistant Register of the United States Treasury, Hon. W. P. Titcomb. So far this year there have been built at the various yards on the Delaware River 51 iron vessels, 5 of steel and 36 of wood. The total tonnage of the iron and steel vessels was 55,079 tons, or 110,158,000 pounds. The total weight of the iron and steel used in the construction of these vessels was 31,810 tons, or 63,620,689 pounds. The 36 wooden vessels built had an aggregate tonnage of 20,426 tons.

If the production during the remainder of the year keeps pace with these figures the total tonnage, estimating partly from present contracts, which are large and numerous, will not fall below 150,000 tons, with an actual weight, represented by steel and iron used in construction, of 180,000,000 pounds, or 90,000 tons. The operations have been conducted at six principal yards—those of the Harlan & Hollinsworth Company and the Pusey & Jones Company, at Wilmington; of John Roach, at Chester; of the American Shipbuilding Company and William Cramp's Sons, at Philadelphia, and of John H. Dialogue, at Kaighn's Point, Camden. The steel and iron monitor Amphitrite is included in the estimate of the operations of the Harlan & Hollingsworth Company. There were built in that yard one steam transportation boat, two steamships, two steamboats, one ferryboat, one coal collier and one steam yacht. The steam yacht and one of the steamboats were of steel. Their aggregate tonnage was 2704 tons. The total tonnage of the nine vessels was 12,883 tons, or 25,766,000 pounds, reckoning 2000 pounds to the ton. The production at the yard of the Pusey & Jones Company during the same period aggregated 1700 tons. The total weight of the iron used in construction was 2,200,000 pounds, or 1100 tons. Among the items of construction was a steam yacht, 36 feet long, upon which was used 15,000 pounds of steel. Six of the vessels were twin screw steamers. The officers of the Harlan & Hollingsworth Company decline to furnish the amount of steel and iron used in building, but upon the average presented in the figures of the Pusey & Jones Company it would appear to approximate 8500 tons.

The largest amount of business was that transacted by John Roach, at Chester. During the six months in question there were built 12 vessels, with a total tonnage of 23,309 tons. The total weight of the hulls of these vessels was 21,914,689 pounds, or 10,957 tons, at 2000 pounds to the ton. Three of the boats were of identical dimensions and general pattern, and were built for the Brazil trade. One, the Cienfuegos, goes to the south side of Cuba, and another will engage in general coasting. The Utowana and Viking were pleasure yachts, and two, the Lampasas and Alamo, are destined for Texas. The Alaskan, a side-wheel steamer, leaves in a few days for the Pacific coast. One of the boats, a steamer intended for the Florida coast trade, is steel-plated. She is not yet named. The largest of these vessels, the Lampasas, is 329¼ feet long, 40¼ feet wide, with a depth of hold of 23½ feet. All of the vessels but one are provided with compound engines.

The operations at the yard of John H. Dialogue, of Kaighn's Point, Camden, were confined mainly to the building of iron tugboats. He constructed one iron vessel, four iron tugboats and one steel and one wooden tugboat. In the former there were used 63 tons of steel. The total amount of iron used in construction was 523 tons. The estimated average value of the tugs was $25,000. Dialogue has also been making, on an average, two tons of anchors per week, which would aggregate, since January 1, something like 70 tons.

There have been seven launches of iron vessels at the yard of the Cramps, at Port Richmond. One of these was the Tacoma, in whose construction there were used 4,200,000 pounds of iron, or 2100 tons. There were built two steamers, which consumed 3650 tons of iron, and a steamer requiring 750 tons of like material. In the building of Jay Gould's steam yacht Atalanta there were used 600 tons of iron. Small vessels and miscellaneous items brought the total of the iron used in construction up to 14,600,000 pounds, or 7300 tons. The average consumption heretofore at this yard has been about 10,000 tons. This year it promises to exceed that figure.

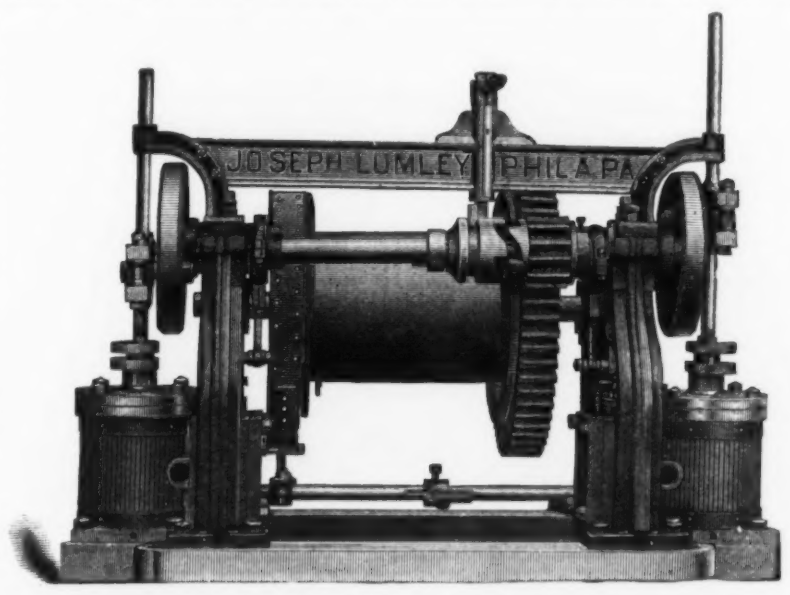
The data regarding the yard of the American Shipbuilding Company, at Port Richmond, of which Lieut. H. H. Gorringe is president, relates only to such vessels as are now well under way on the stocks, owing to the recent establishment of operations. There are nine large ships being constructed, and the total quantity of iron called for aggregates 2940 tons. Two of the vessels are of 2000 and 2200 tons tonnage respectively, and four are three-masted schooners. One is a steam collier, registering 900 tons; the rest tugboats of from 40 to 75 tons.

"Is it not true," was asked of one of the largest iron and steel shipbuilders, "that the development of the iron shipping interests is rather in the direction of foreign countries?"

"Yes. The South American nations, in particular, are coming to the Delaware to buy and build their vessels. The Pusey & Jones Company, of Wilmington, are almost exclusively in the building of boats for Brazil, United States of Colombia and other South American countries. Even our wooden ships are going to Mexico, Cuba and the West Indies. The Delaware River presents unrivaled advantages for shipbuilding, and year by year, from this time forth, they will be eagerly seized upon and developed."

Double-Cylinder Hoisting Engine.

We present herewith an illustration of a new and improved double-cylinder hoisting engine, made by Mr. Joseph Lumley, of 144 North Third street, Philadelphia, Pa. It is specially adapted for discharging vessels, hoisting materials in warehouses, coal yards, and will also be found serviceable on mine and ore banks. The engine can be bolted to the deck of a steam barge, and, with a cylinder of 6 x 6½ inches, it will occupy a floor space of only 4 square feet. Simple inspection will show that the apparatus is strongly built and well adapted to its work. The cog and pinion are made of the best cast steel, thus insuring durability. Every engine is tested before leaving the establishment, and, if desirable, can be delivered in a portable form.



Double-Cylinder Hoisting Engine.

Japanese Metal Work.

In a lecture recently delivered at Stuttgart, Germany, Mr. G. Richter gave some attention to the skill exercised by the Japanese in working metals, and among other things stated that the name *karakana* for metal points to the conclusion that the manufacture of bronze was introduced from China. It must, however, have been known in Japan for a long time, since the first Europeans who visited the country found bronze guns and small arms. Japanese bronzes contain principally copper and tin, with a small addition of lead or zinc. In the second half of the fifteenth century, a certain Yuido exerted a great influence upon the development of the manufacture of bronze. He was the founder of ornamental art, and celebrated for his great skill in preparing models. The principal products of the Japanese bronze industry are figures, vases with flowers or birds, decorations, or both combined, as well as fishes, dragons, censers, &c. The execution of the bronzes points to great care being employed, and the casting of large dragons and other objects in one piece has hitherto not been accomplished by any other nation. The best bronzes are made for the temples. A vase and a candlestick are placed one on each side of the god, in the center a censer, and below two lanterns. The old vases and candlesticks were formerly not made in pairs—each formed a separate work of art. The manufacture in pairs was only encouraged later, by the export trade which set in.

Great care was also formerly exercised upon the ornamentation of swords. The guards and handles of daggers and knives were adorned by the most beautiful bronzes. The sword guards and the dagger handles are made of chased iron inlaid with bronze. No less artistic are the *netzkys* or the *kanemons*, which are buttons serving the same purpose as the former, but are also used as sword suspenders. They are decorated with colored bronzes, each being a perfect work of art. The alloy of bronzes of blue-black color principally employed, and called *shakudo*, consists of copper, with 3 per cent. of gold. An alloy consisting of three parts silver and one part copper gives a silver-gray color, called *shiubu-ichi*. The art of working iron has been brought to a perfection in Japan, the author said, which justly deserves the admiration it has called forth. Witnesses of this excellence are the old sword blades, which are richly ornamented. A master in the art was Miyochin-Meneharu, who lived in the sixteenth century. One of his works, unique of its kind, is in the British Museum. It represents a sea eagle, standing with extended wings, bristling plumage and outstretched claws, upon a rock. Each single feather is wrought, and the whole is so true to nature that it deserves the appellation of unique. Proceeding to two other branches of metal working, enameling and *cloisonné*, the author said that it had not been proved when the art of enameling was first introduced. It is affirmed with certainty that it has been known for centuries. In enameling copper the enamel is applied to the object, the form of the flower or arabesque being completed. The Japanese are such experts that they finish with one color everything that has to be done in that color; they then follow on with the other colors, until the whole work is finished.

In working *cloisonné* the process is more complicated. The gold wire employed is rubbed with the juice of a kind of onion. That juice is so sticky that it fixes the wire on the surfaces, and the figures made are then filled in with enamel. In both processes the object is placed in an oven, which is heated until the enamel begins to shine. As soon as the luster appears, this is a sign that it has been melted. The process requires the greatest care; for, should the oven be overheated, the enamel is burned and drops off. It also happens that the enamel is too thin in some places, when it gets burned before the other parts are finished. When the object enameled has become cool, the inequalities are rubbed with a fine sandstone by hand, and the enamel is finally polished.

Another method of enameling is to cut out the figures in metal. The deepened portions are then filled in with enamel, and the whole is treated in the same manner as in the other process. Metal plates with raised and smooth enamel are used as inlays for drawers and other articles of wood. Both kinds of enamel, especially those of many colors, are also produced on porcelain. A lacquer-like enamel, like *cloisonné* work, is used for wood. This is an invention of more recent times. Chinese *cloisonné* long enjoyed the name of being the best. But the Japanese have eclipsed it in the purity and beauty of color and the art of decoration.

Report of Commissioner of Patents.—The Commissioner of Patents has submitted to the Acting Secretary of the Interior his report of the business of the Patent Office for the fiscal year ending June 30, 1883. The report shows that:

The number of applications for patents received was	32,845
Number of applications for design patents received	1,019
Number of applications for reissue patents received	247
Number of applications for registration of trade marks	854
Number of applications for registration of labels	749
Total	35,734
Against, in 1882	30,662
Number of caveats filed	2,688
Number of patents granted, including reissues and designs	21,185
Number of trade-marks registered	881
Number of labels registered	618
Total	22,686
Number of patents withheld for non-payment of final fees	2,056
Number of patents expired	7,471
Receipts from all sources	$1,095,884
Expenditures (not including printing)	677,628
Surplus	$518 255

The increase in receipts over 1881 was $305,989, and over 1882, $165,020. The number of applications awaiting action on the part of the office on July 1, 1883, was 4,699, an increase of 39 per cent. over 1882.

The *Railway World* publishes the following table showing how many American carwheels were exported during the last four fiscal years, and to what countries they were sent:

	1879	1880.	1881.	1882.
Argentine Republic	244	204	96	182
Belgium	460	390	201	322
Brazil	632	1,362	1,348	2,848
Central America	4	8	10	2
France	..	..	50	..
Chili	210	208	336	336
Germany	30	248	206	..
England	1,603	3,045	2,096	1,680
Scotland	104	720	422	210
Gibraltar	40	..	..	..
British North America	943	1,120	434	270
" West Indies	40	..	16	..
" Guiana	..	..	..	24
Australia	24	136	41	316
Hawaiian Islands	..	69	150	100
Hayti	..	405	84	46
Dutch West Indies	..	8	16	..
Mexico	30	36	2,550	2,202
Netherlands	24	..	..	..
Peru	130	..	..	440
San Domingo	42	9	148	16
Spain	..	100	..	404
Cuba	2,926	2,106	2,422	1,754
Porto Rico	..	28	72	12
United States of Colombia	350	554	270	439
Uruguay	420	84	654	200
Venezuela	4	24	74	16
Total	2,270	10,864	11,697	12,319

Tile Making in Holland.

The tiles manufactured in Holland, as described in the *Glassware Reporter*, are flat, hollow, S-shaped, or with a square opening in the middle to let in a pane of glass, being much used for lighting lofts and garrets all over the low countries. They are either red, gray or blue, or glazed on one side only. The flat paving tiles are about 8½ inches square by 1 inch thick; they are used principally for cisterns and for bakers' ovens. The clay for tiles, it is to be noted, is in all cases more carefully prepared than that for bricks, being ground up wet in a pugmill or tub, with a shaft carrying half a dozen blades. By this means, roots, grass, &c., are got rid of. The clay comes out of the pugmill of the consistence of potter's clay, and is kept under a shed, where it is kneaded by women, with their hands, to the rough form of a tile, on a table dusted with sand. These pieces are carried off to the molders, who are two in number, a rough molder and a finisher. The tiles are then dried under sheds, and afterward in the sun. With regard to the flat paving tiles, they are at first rough-molded about 1 inch larger than the subsequent size and a little thicker, and then laid out to dry under a shed, until such time as the thumb can hardly make an impression on them. They are then taken to a finishing molder, who, on a table quite level and slightly dusted with sand, lays one of the tiles, and strikes it twice or thrice with a rammer of wood larger than the tile, so as to compress it. He then takes a mold of wood, strengthened with iron and with iron cutting edges, and puts it on the tile, which he cuts to the size. The mold is of course wetted each time it is used. The tiles are then regularly dried. In Switzerland and Alsace an iron mold is used.

The tile kiln is generally within a building, and about 16 feet long (in ordinary dimensions), 10 feet wide and 10 feet high. The walls are from 4½ to 5 feet thick, secured outside with great beams, and so secured together as to form a square frame. Some of the largest of them are pierced with four flue-holes, as in brick kilns, but the flues are formed by a series of brick arches, about 2½ feet wide by 16 inches high. The opening of the flue-hole is about 10 inches by 8 or 9 inches high. On their upper surface these series of arches form a grating, on which the tiles are laid. The kiln is covered in at the top with a brick arch, pierced with holes of different sizes. The kilns are charged from an opening which is constructed in one of the side walls, which opening is, of course, during the burning, blocked up and well secured. The fuel used is turf, as in the brick kilns, and the fire is kept up for 40 hours together, which is considered enough for the burning. Three days are then allowed for cooling, and they are afterward taken out of the kiln. Those tiles which are to be made of a grayish color are thus treated. It having been ascertained that the tiles are burnt enough, and while still red-hot, a quantity of small fagots of green alder with the leaves on is introduced into each flue. The flue-holes are then well secured, and the holes in the roof each stopped with a paving tile, and the whole surface is covered with 4 or 5 inches of sand, on which a quantity of water is thrown, to prevent the smoke from escaping anywhere. It is this smoke which gives the gray color to the tiles, both internally and externally.

The kiln is then left closed for a week, when the sand is taken off the top, the door and roof-holes are opened, as also the flue-holes, and the charcoal produced by the fagots taken out. Forty-eight hours after the kiln is cool enough to allow of the tiles being taken out and the kiln charged again. Whenever any of the tiles are to be glazed they are varnished after they are baked; the glaze being put on, the tiles are put in a potter's oven till the composition begins to run. The glaze is generally made from what are called lead ashes, being lead melted and stirred with a ladle till it is reduced to ashes or dross, which is then sifted, and the refuse ground on a stone and resifted. This is mixed with pounded calcined flints. A glaze of manganese is also sometimes employed, which gives a smoke-brown color. Iron filings produce black; copper slag, green; smalt, blue. The tile being wetted, the composition is laid on from a sieve.

The manufacture of tiles is principally carried on near Utrecht, in the Province of Holland, which, like most of the great cities of Holland, has facilities for the transportation of its produce by water communication all over the country.

Hydraulic Power.

The idea of supplying hydraulic power as a cheap and efficient means for lifting goods in warehouses, and for sundry other daily purposes where motive power is required, is now receiving attention in London. The General Hydraulic Power Company, of that city, in conjunction with the Wharves and Warehouses Steam Power and Hydraulic Pressure Company, have, it appears, been established for the supply of an efficient motive power suitable for various requirements, and by the operation of these companies, it is stated, the smallest building can be served with power at a cost proportional to the requirements of the consumer.

According to an English exchange, this has not been the case hitherto. A firm who required lifting power have had to expend a large amount in apparatus at the outset, either in the shape of steam or hydraulic power. Although hydraulic lifts are largely employed at the London Docks and goods stations, and in many warehouses, this mode of conveyance is still rarely used in smaller commercial buildings, where hand power is almost entirely employed. As the smaller warehouses are far more numerous than the large ones, it follows that a comparatively very small proportion employ hydraulic power. The company offer advantages to the smallest consumers; thus, the dinner lifts in restaurants and chop houses, the passenger and patient lifts in hotels and hospitals, and the lifting of safes and books in banks and commercial houses, can be worked easily, safely and cheaply from the public main. Not only in lifting, but in other requirements where steam and gas are now used, can hydraulic power be applied, and even the electric light can be developed by the same agency.

Such are the objects which the Wharves and Warehouses Company, under an act of Parliament, intend to bring within everyone's reach within the area proposed to be served by mains. The works now being carried out will supply an area on both sides of the River Thames, and hydraulic power mains are being laid between these localities, so that power will be supplied to the public at a low rate, for hydraulic mains are kept charged by pumping engines at the company's central station. The reservoirs consist of accumulators, which produce the same effect as large tanks at a great hight above the street level. The supply of water is from the river, but all sediment is removed before it is pumped into the pipe. The pipes in the streets are put down free of charge, and the company also provide machines to consumers on deferred payments or otherwise, agreeing also to maintain them in working order at a small annual charge. The pipes will bring to the door of every consumer within the area proposed to be treated a reliable water-power, always available, and of such a force that a 1-inch pipe will supply, if required, as much as 10 horse-power. The measurement of the power will be by meter.

An hydraulic power company has already been at work for some years at Hull, where the power has been greatly esteemed and the consumers are increasing, and it is some guarantee of the success of this present scheme that those who have had the management of the Hull undertaking are connected with the London works. The scale of charges is regulated by the consumption on the premises, and a sliding scale is adopted. A minimum charge is made for each machine of about $6.25 per quarter. Under 3000 gallons the charge is $6.25 per machine per quarter. Above 3000, and not exceeding 5000 gallons, the charge is $2 per 1000 gallons; from 5000 to 10,000, $1.75 per 1000; 10,000 to 20,000, $1.50, and so on in a descending scale, and above 200,000 gallons special terms are arranged.

British Iron and Steel Exports to the East.

The fact that the past few years have witnessed a gradual increase in the shipments of iron and steel from Great Britain to the far East is attracting a good deal of attention. Many of our English exchanges have of late referred to the subject at frequent intervals, and look upon this development of Great Britain's Eastern trade as an efficient means to make good the losses sustained in other quarters. We append herewith a table showing the results obtained during the past 12 years. Dividing these years into two periods, it will appear that, when compared with the period 1870 to 1875, that extending from 1876 to 1881 exhibits a progress in the iron shipments to Australasia of nearly 600,000 tons:

	1870–75. Tons.	1876–81. Tons.	1882. Tons.
New South Wales	162,892	384,545	101,410
Queensland	32,062	114,146	34,349
Victoria	347,277	370,360	117,515
South Australia	113,826	259,463	59,262
West Australia	4,804	13 147	1 477
Tasmania	13,361	13 684	4,478
New Zealand	183,441	271,801	54,043
Total	852,213	1,436,201	377,064

Thus, it will be seen, the increase of the second period over the first amounted to 584,201 tons; the excess of 1882, compared with 1881, when the shipments comprised 315,420 tons, is equal to a further excess of 61,834 tons.

The volume of business done in shipments of iron and steel to Australasia has, during a period of 25 years, swelled up to an aggregate of 3,011,757 tons. The Province of Victoria heads the list as largest consumer during the period of a quarter of a century. In spite thereof, however, it must not be forgotten that a very large contract for the supply of railway passed the doors of British iron works last year. The Victorian Government, it is alleged, offered greater facilities for the supply of rails than the markets of the mother country could afford to grant the Australians. These figures show the total shipments during 25 years—1856 to 1881—with the proportion per cent. of total distribution to each portion of the Colony:

	Tons.	Per cent.
Victoria	1,161,136	38.5
New South Wales	652,255	21.6
New Zealand	512,215	16.9
South Australia	461,326	15.4
Queensland	165 662	5.5
Tasmania	45,251	1.5
West Australia	18,598	0.6
Total Australasia	3,016,757	100.0

The new steamship line of the Chesapeake and Ohio Railroad will be opened October 10. The line is to be called the Union Steamship Company, Limited, and will comprise 12 boats. Newport News, the seaboard terminus of the railroad, is attracting much attention as a coaling station for foreign steamships, the convenience of the port for ingress and egress, and the superior quality and comparative cheapness of the New River coal for steamship purposes, rendering Newport News one of the most advantageous coaling stations on the Atlantic coast. Over 200 steamships were coaled there last season, and the Chesapeake and Ohio Railway Company have been increasing and perfecting their facilities for supplying steamers with coal in anticipation of a very large increase in the business for the coming season, which the contracts they are now making indicate.

The first freight train to New York by way of the new depot of the New York, Ontario and Western and the New York, West Shore and Buffalo railroads reached this city on the morning of September 11, consisting of 10 cars, mainly laden with butter, cheese and hops. The facilities for handling the freight are commodious, and the shippers express great satisfaction with the arrangements. Four tugboats, one steam lighter and six floats are already completed, and others will be added as business demands. The depot in Weehawken, when completed, will occupy 1¼ miles of river front. There will be 5½ miles of dock room, besides accommodation for 8000 cars and extensive cattle yards. The passenger depot is nearly finished.

Special Notices.

BARGAINS.

30-in. swing, 18 ft. bed, New Haven Lathe.
24-in. swing, 17 ft. bed, Bement, Marshall & Ball Lathe.
20-in. swing, 10 ft. bed, Perkins Lathe.
16-in. swing, 8 ft. bed, Hadley Falls Lathe.
16-in. swing, 6 ft. bed, Perkins Lathe.
16-in. swing, 6 ft. bed, New Haven Lathe.
23 in. x 9 ft. bed, New Haven Planer.
30 in. x 7 ft. bed, New Haven Planer.
12½ x 24 Horizontal Engine.
12 x 24 Horizontal Engine.
10 x 16 Horizontal Engine.
10 x 14 Horizontal Engine.
10 x 12 Horizontal Engine.
9 x 12 Horizontal Engine.
Two 8 x 12 Horizontal Engines.
2½ x 14 Horizontal Engine.
Two 7 x 10 Horizontal Engines.
5 x 10 Horizontal Engine.
8 x 10 Vertical Engine.
6½ x 8 Vertical Engine.
6 x 7 Vertical Engine.
6 x 6 Vertical Engine.
5 x 6 Vertical Engine.
4½ x 5 Vertical Engine.
4 x 4 Vertical Engine.
3 x 4 Vertical Engine.
10 Horse Portable on skids.
42 x 9 ft. Vertical Boiler, 88 2-inch tubes.
36 x 8 ft. Vertical Boiler, 66 2-inch tubes.
39 x 7 ft. Vertical Boiler, submerged tubes.
Two 30 x 6 ft. Vertical Boilers.
28 x 6 ft. Vertical Boiler.
24 x 5 ft. Vertical Boiler.
22 in. x 5 ft. Vertical Boiler.
36 x 10 ft. Horizontal Boiler.
30 in. x 7 ft. 10 in. Horizontal Boiler.

A large assortment of all styles of Boilers, Engines, Belt Jumps, Shafting, &c., &c.
Write for prices and tell us what you want.

LOVEGROVE & CO., 152 N. Third St., Phila.

For Sale.

EUREKA IRON CO.'S PROPERTY
AT WYANDOTTE, MICH.

The Charter of this Company expires by limitation on the 24th of October next, and the whole of the plant and real estate is now offered for sale. If any portion remains unsold at private sale on the 16th of October, 1883, it will be offered at Public Vendue, at the office of the Company, in Wyandotte, at 11 o'clock A. M. on that day.

The property consists in general of two Blast Furnaces (one in use and one modern rebuilding). They have all the plant necessary for making 70 to 80 tons Charcoal Pig Iron per day. The furnace rebuilding can be used for making Coke Iron.

The Mills for the manufacture of Boiler Plate, Tank, Sheet and Bar Iron, Knobbing and Puddling Furnaces are complete, as well as the Foundry Cupolas, Boiler, Machine, Blacksmith and Pattern Shops, Testing Machines, Weigh Scales, Docks, Railroad Tracks, Locomotives, Charcoal Kilns, Cars, Dock, Steam Cranes, &c., &c.

Brick general offices, with about 1200 acres of land in and contiguous to Wyandotte, and about 270 City Lots. Quantity of ore, pig iron, &c.

For details, apply to

W. S. ARMITAGE, Sec'y, Detroit.

PEREMPTORY PUBLIC SALE OF VALUABLE PROPERTY.
Keystone Hardware Manufacturing Co., Reading Pa.

All that certain property situate on the southwest corner of Tenth and Spruce streets, in the city of Reading, bounded and described as follows: On the North by Spruce street, on the East by Tenth street, on the South by Muhlenberg street, and on the West by Orange street, containing in front, on Spruce street, 225 feet, and in depth, along Tenth street, 291 feet, known as

THE KEYSTONE HARDWARE WORKS,

consisting of a Foundry, Warehouse, Machine Shop and other buildings, together with all the appurtenances, Machinery, Tools, Patterns, Fixtures, &c., all in first-class running order, will be offered at PUBLIC SALE, Saturday, November 3, 1883, at 1 o'clock p. m., on the premises. Easy terms and conditions will be made known at time of sale.

F. C. SMINK, President,
Keystone Hardware Mfg. Co.

For Sale.

A complete set of housings to fit 26-inch train. Will be sold at about price scrap iron.

Address
CHAS. K. LIPPINCOTT & CO.,
330 Walnut street, Phila., Pa.

FOR SALE.

Extra Heavy
24-INCH LATHES

Strongly geared; also Heavy and Improved 36 inch Planers. Good workmanship and material. Price very low.

B. GRAVES LOUDEN,
22d st. and Washington ave.,
Philadelphia.

Wanted.

A first-class salesman on steel by an old-established house.

Brand widely and well known as unsurpassed in quality. Apply in own handwriting, stating terms, reference and experience, to

M. Z.,
Office of *The Iron Age*, 83 Reade St., New York.

FOR SALE.

Nos. 1, 2, 3, 6 and 8 Sturtevant Blowers; Nos. 2, 4 and 32 do. Exhausters; Vertical Engines, 2 H. P. and up; Horizontal (Burdon) do., 16 x 36; Baxter do., 4, 6 and 10 H. P; (Chain) Planer, 24 x 20 x 5; Lathe, 30 x 14; Hoisting Engine, 9 x 12; Clayton Air Compressor, 24 x 24 (new). Wanted: Root, McKenzie, Sturtevant and Baker Blowers, Engines, Boilers and Machine Tools to sell. Correspondence solicited. Purchases carefully made for parties out of the city. C. R. BIGELOW, M. E.,
18 New Church St., New York City.

MANUFACTURING PROPERTY by auction, consisting of Iron Foundry, 120 x 40; Brass Foundry, 2[illegible] x 18; Furnishing Shop, 3 stories, 120 x 30; 40 Horse-Power Engine and 60-Horse-Power Boiler, latest improved; Japanning Ovens, Shafting—all new; situate contiguous to Steamboat wharf and Railroad station, at Rocky Hill, Conn. Will be sold without reserve, October 25, 1883, at 11 o'clock a. m., unless sooner disposed of. For further information address H. H. GRANT, Rocky Hill, Coun.

Patent Interest for Sale.

A new Self-Locking Sash Fastener. Nothing like it in the market. A good opportunity for a good, energetic man who is well versed in the Hardware trade. Would also like a good Manufacturing Co. to take hold of it to manufacture it on royalty.

For further particulars inquire of
HENRY BAUSCH,
P. O. Box 354, Rochester, N. Y.

REQUIRED, by a gentleman with nine years' experience in the various departments of a large Siemens works in South Wales, an appointment in shop preferred in works (Siemens) producing Plate and softer qualities of Steel. Address, "S. W. C.,"
Care of W. H. SMITH & SON,
Railway Station, Swansea, South Wales.

Special Notices.

E. BISSELL & CO.,

WHOLESALE AUCTIONEERS.

LARGE, SPECIAL & PEREMPTORY SALE OF

Hardware, Edge Tools, Guns, Table and Pocket Cutlery, Carvers' and Butcher Knives, &c.,

FIRST AND SECOND QUALITY,

ON

WEDNESDAY, THURSDAY & FRIDAY,

September 26th, 27th and 28th,

AT 10 O'CLOCK A. M.,

AT OUR SALESROOM,

83 Chambers and 65 Reade Sts., New York.

WEDNESDAY, SEPT. 26th,

The sale will comprise a large assortment of various kinds of Hardware—also 50 dozen C. S. Picks and Mattocks, 300 dozen Hammers, Axes, Handled Axes and Hatchets, &c., Miller's and other Brands; 2000 dozen Royal and other Brands of Mill, Flat, Bastard and Taper Files; 50 dozen Hand and Panel Saws; Cases Sledge Hammers; a large assortment of Machine Screws, firsts; 100 dozen D, H. and L. H. Shovels and Manure Forks; cases of first quality Smooth, Jack and Fore Planes; Beads and Match Planes; Hollows and Rounds, &c. The Planes to be sold are of the very best material, both as regards Irons and Stocks, and are all first quality.

Also full assortment of first quality C. S. Socket, Framing and Firmer Chisels and Gouges, and sets of same; Tanged Firmer Chisels and Gouges, and sets of same; Extra Drawing Knives, all sizes, &c., &c. The above Tools are the manufacture of the Arlington Edge Tool Co., and BEST GOODS. Also Padlocks, Fry Pans, Basting Spoons, Saw Handles, Wrought Butts, &c., &c., &c.

THURSDAY AND FRIDAY, Sept. 27th and 28th,
AT 10 O'CLOCK,

Special and peremptory sale of Table and Pocket Cutlery, first and second quality, comprising about 20,000 dozen Table Knives and Forks, and Table Knives only, desirable patterns; 2000 pairs Carvers; also, Ivory, Rubber, Solid Bone, Stag and Pearl Handle Knives and Carvers. Several hundred dozen Silver-plated Tea and Table Spoons, Forks and Knives, Standard, Extra and 12-ounce plate; Sets plated Moits; Butcher and French Cooks' Knives; 500 dozen Pocket Knives; Nickel-plated Shears, &c., &c.

Also for Account of Whom it May Concern:

69 English Breech and Muzzle-loading Double Barrel Guns, the stocks of which have been slightly bruised on voyage of importation—otherwise in good condition. Guns will be sold Thursday, Sept. 27th, at 12 o'clock. The attention of the trade is called to this sale.

For Sale Cheap.

A No. 1 Engine, 12 x 10 inch stroke, very heavy bed-plate, 11 ft. long; Fly Wheel, shaft, Pulley, &c., complete. Engine, 8½ x 12 inch stroke, all complete. New Steel (Tubular) Boiler, 10 feet long, 36 inches diameter, Stack Front, &c., ready for use. Two large Steam Shears, suitable for Rolling Mill or Scrap Iron Yard Shears, Pipe, Tank, Boiler Plate and Rails, Iron or Steel; all fully geared, in working order. A great bargain. Address "OWNER,"
P. O. Box, No. 459, Pittsburgh, Pa.

For Sale.

We offer for sale a nearly good as new horizontal steam engine of 22 inches diameter of steam cylinder, by 6 feet stroke, with hot-water pumps and heater all complete. Price on cars, $2000; weight about 72,000 pounds. Immediate delivery; sold for want of use. Can be seen at our works.

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Hardware Business For Sale.

In a large and rapidly growing manufacturing town in Western New York. An old-established business in the best location in town, with exclusive control of several leading articles in the trade. Proprietor's ill health the cause of selling.

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WIRE NAIL AND TACK MACHINES,

OF BEST AND LATEST CONSTRUCTION,

MALMEDIE & HIBY,

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BLAST FURNACE MANAGER.

Situation wanted by a Furnace Manager who has erected and managed large works. Has been accustomed to the details and management of Mines, Railroads and all official duties and reports connected with the position.

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DISCOUNT BOOK

Specially arranged for the use of the
HARDWARE TRADE.

Acknowledged by ALL the best work of the kind ever published. Price by mail ONE DOLLAR.

Address E. B. LEIGH,
Sec'y The American Brake Co., St. Louis, Mo.

Wanted.

A FIRST-CLASS STEEL ROLLER,

industrious, experienced and capable of Rolling Rounds, Squares, Flats and miscellaneous sizes to exact gauge. Sober and able to manage men. A fine place and good pay to the right man. None but capable workmen need apply.

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For Sale.

"ACME" BOLT CUTTERS.

6 Single Bolt Cutters, cutting from ¼ in. to 1 in.
3 Single Bolt Cutters, cutting from ⅝ in. to 1¼ in.
12 Single Bolt Cutters, cutting from ½ in. to 1½ in.
2 Single Bolt Cutters, cutting from ¾ in. to 2 in.
2 Single Bolt Cutters, cutting from ¾ in to 2½ in.
1 Single Bolt Cutter, cutting from 1 in. to 3½ in.
6 Double Bolt Cutters, cutting from ⅛ in to 1½ in.

With or without Automatic Motion.

NUT TAPPERS,
BOLT POINTERS, &c.

Specialist in All Kinds of
BOLT and NUT MACHINERY.

NOVELTY IRON WORKS,
CLEVELAND OHIO.

LIST OF NEW MACHINERY
FOR SALE.

1 Engine Lathe, 20 ft. bed, 42 in. swing.
1 " 18 " 36 "
1 " each 14, 16 and 18 ft. bed, 30 in. swing.
1 " each 10 and 12 ft. bed, 27 in. swing.
1 " each 8, 10 and 12 ft. bed, 23 in swing.
1 " each 8, 10 and 12 ft. bed, 19 in. swing.
1 " 8 ft. bed, 18 in. swing.
1 " each 6 and 8 ft. bed, 16 in. swing.
1 " 6 ft. bed, 15 in. swing.
1 " 5 " 11 "
2 Iron Planers, to plane 10 ft., 30 x 30 in.
2 " to plane 7 ft., 26 x 26 in.
2 " to plane 4 ft., 22 x 22 in.
1 each 22, 24, 26, 30 and 38 in. swing B. G. S. F. Upright Iron Drills.
1 Shaper, each 10 and 15 in. stroke.
2 Shapers, each 12 in stroke.
2 Bolt Cutters, to cut 1⅛ and 2 in.

Send for lists of new and second-hand Tools.

The Geo. Place Machinery Company,
No. 121 Chambers and 103 Reade Sts., New York.

Notice.

I am in business in Chicago and employ traveling salesmen. I desire to represent manufacturers of Brass and Iron Goods for Railroads, Engine Builders, Plumbers, Gas and Steam Fitters, Tools, Metals, Tin Plate, Tubing and Wire, Steam Packing, Patent Machines, &c., &c. I will either act as agent or carry goods in stock at liberal discounts. Best references. Address

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Care of the Chicago Smelting and Refining Works, Nos. 64 and 66 So. Canal St., Chicago.

New Inventions.

Patentees desirous of introducing their inventions

Into the English Market,

are requested to address their circulars, with full particulars, prices and best discounts, to

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Wholesale Merchants and Factors for Engineers' and Ironmongers' Goods.)

NOTE.—All quotations must include free delivery to London or Liverpool.

Wanted.

POSITION AS ENGINEER.

An Engineer and Constructor of Iron Works is open for a new engagement after the 1st of October next. Address

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HEAVY CASTINGS AND ROLLS.

Wanted to buy Old Heavy Castings and Rolls of all kinds. Address

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Notice.

I will sell 200 Shares Stock of the Chicago Tire and Spring Works, or any part of the 200 Shares, to the highest bidder; Shares, $100 each. This is the best paying stock in Illinois. No reasonable offer refused, and warranted genuine.

Address LESLIE IRON WORKS,
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CORRESPONDENCE SOLICITED

from parties intending to purchase Steam Rivetters, Steam Hammers, Hydraulic Presses, Heavy Punch and Shears, &c., &c.

Estimates given for good work very low.

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Exchange Memberships

Bought and Sold by
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Dealer in
EXCHANGE MEMBERSHIPS.

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By a large importing house, two experienced traveling men who thoroughly understand the Foreign Cutlery and Hardware Trade. Please address, giving full particulars of experience, references and salary expected,

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Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

Pig Iron Salesman, experienced in the Western trade. A liberal salary given to good man.

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Office of *The Iron Age*, 83 Reade st., New York.

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NEW AND SECOND-HAND
MACHINERY.

1 Engine Lathe, 39 in. swing, 18 ft. bed. 2d hand.
1 Engine Lathe, 36 in. swing, 20 ft. bed. New.
1 Engine Lathe, 34 in. swing, 17 ft. bed. New.
1 Engine Lathe, 34 in swing, 9 ft. bed. New.
1 Screw-cutting Gap Lathe, 26 in. swing over bed, 48 in. swing over gap; bed 24 ft. long. New.
1 each Engine Lathes 26 in. swing, 10 ft., 12 ft., 14 ft., 16 ft., 20 ft., 24 ft. bed. New.
2 Engine Lathes, 24 in. swing, 9 ft. bed. New.
1 Engine Lathe, 23 in. swing, 16 ft. bed. 2d hand.
1 each Engine Lathes, 21 in. swing, 6 ft., 8 ft., 10 ft., 12 ft. bed. New
1 each Engine Lathes, 20 in. swing, 6 ft., 8 ft, 10 ft., 12 ft. bed. New.
1 Engine Lathe, 20 in. swing, 8 ft. bed. 2d hand.
1 Engine Lathe, 20 in. swing, 9 ft. bed. 2d hand.
1 each Engine Lathes, 19 in. swing, 7 ft, 8 ft., 10 ft. bed. New.
4 Engine Lathes, 19 in. swing, 6 ft. bed. Nearly new
1 Engine Lathe, 19 in swing, 7 ft. bed. 2d hand.
1 Engine Lathe, 18 in. swing, 21 ft. bed. 2d hand.
1 Engine Lathe, 18 in. swing, 10 ft. 6 in. bed. 2d hand
1 each Engine Lathes, 17 in. swing, 6 ft., 7 ft., 8 ft., 10 ft. bed. New.
1 Engine Lathe, 17 in. x 7 ft. bed. 2d hand.
1 Engine Lathe, 15 in. swing, 9 ft. bed. 2d hand.
2 " 15 " " 6 " " New.
1 " 14 " " 6 " " 2d hand.
1 " 13 " " 6 " " New.
3 " 13 " " 5 " " "
1 " 12 " " 5 " " "
1 " 11 " " 5 " " "
1 " 10 " " 4 " " "
2 Hand Lathes, 15 in. x 5 ft. bed. New.
1 " 13 in. x 5 ft. bed. 2d hand.
1 " 12 in. x 4½ ft. bed. New.
1 " 12 in. x 4 ft. bed. New.
1 " 11¼ in. x 4 ft. bed. New.
1 " 11 in. x 5 ft. bed. B. G. 2d hand.
1 " 10 in. x 2 ft. New.
1 Single Head Lathe.
1 Bench Lathe, 8¼ in x 3 ft. bed. New.
1 Foot Lathe, 8½ in. x 3 ft bed. New.
1 Foot Lathe, 12 in. x 4 ft. bed. New.
2 Foot Lathe, 8 in. x 3 ft. bed. Back-geared.
1 Foot Lathe, 8 in. x 2 ft. 8 in bed. New.
1 Turret Lathe and Chuck. 2d hand. 16 in. x 5 ft.
1 Axle Lathe. New.
1 Planer to plane 31 in. x 30 in x 6 ft. 2d hand.
1 Planer to plane 34 in. x 32 in. x 12 ft. 2d hand.
1 Planer to plane 32 in. x 32 in. x 8 ft. Nearly new.
1 Planer to plane 27 in. x 27 in. x 7 ft. New.
1 Planer to plane 24 in. x 24 in. x 8 ft. New.
1 Planer to plane 24 in. x 24 in. x 6 ft. New.
1 Planer to plane 24 in. x 24 in. x 5 ft. New.
1 Planer to plane 22 in. x 22 in. x 5 ft. New.
1 Planer to plane 20 in. x 20 in. x 4 ft. New.
2 Planers to plane 16 in. x 16 in. x 3 ft. New.
3 Crank Planers. New.
2 Shapers, 15-in. stroke, 23-in. traverse. New.
1 Shaper, 8 in. stroke. New.
1 Shaper, 6 in. stroke. New.
1 Shaper or Compound Planer, 10 in. stroke, 8 ft. 9 in. bed. Traveling Head, with 2 Tables.
1 Shaper, 12-in. stroke, 33-in. traverse. New.
1 Shaper, 12-in. stroke, 18-in. traverse. New.
2 Shaping Machines, 7-in. stroke. 2d hand.
1 Back-geared Milling Machine. New.
1 Milling Machine, with Arm. New.
1 Lincoln Miller. New.
1 Hand Milling Machine. New.
1 Miller and Screw Slotter, combined.
1 Double Face Miller. New.
1 Automatic Milling Machine. New.
1 40-in. Radial Drill. New.
1 48 in. " "
1 42-in. swing Upright Drill, B. G. & S. F. New.
3 24-inch Up. Drills, Bk. Gr. and Self Feed. New.
1 20-inch Lever Feed Upright Drill. New.
1 20-inch Lever and Wheel Feed Upright Drill. New.
1 Sensitive Drill New.
1 Pratt & Whitney 4-Spindle Drill. 2d hand.
1 Garvin's 4-Spindle Drill. 2d hand.
1 4-Spindle Drill Press. New.
1 3 " " " "
1 2 " " " "
1 Single Spindle Light Drill, Table Feed. New.
2 Bench Drills, Lever and Wheel Feed.
1 Single Spindle Profiler. New.
1 Two " " Light. New.
1 No. 2 Screw Machine, wire feed. New.
1 Screw Machine. New. Not wire feed.
1 " Slotter. "
1 Cutter Grinder. "
6 Emery Grinders. New.
1 Slitting or Circular Shear. New.
2 Tapping Machines.
1 Upright Bor. and Turn. Mill, 10 ft 4 in. swing. 2d h.
1 12-in. Slotting Machine, 50-in. swing. New.
1 8-in. " " 36-in. swing. New.
1 Hydraulic Wheel Press for 72-in. Wheels. New.
1 13 ft. Bending Rolls. 2d hand.
1 Squaring Shear, 22 in. New.
3 Power Presses. New.
1 Foot Press. New.
1 Screw Press. New.
1 Drop Press. New.
1 Hand Lever Punch. 2d hand.
1 Lot Heavy Tolisting Frames 2d hand.
3 Shafting Straighteners. New.
1 8 x 8 Upright Engine. New.
1 8 x 12 Portable Engine and Boiler. Good as new.
1 8 x 12 Horizontal Stationary Engine. Nearly new.
1 10 x 12 Horizontal Stationary Engine. New.
1 9¾ x 12 in. Horizontal Stationary Engine. New.
1 5 in. x 6 in. Horizontal Stationary Engine. New.
1 5 x 12 Horizontal Stationary Engine. 2d hand.
1 10 H. P. Cylinder Boiler. 2d hand.
1 10 H. P. Upright Boiler. New.
1 10 H. P. Upright Boiler. 2d hand.
1 12 H. P. Locomotive Boiler. Nearly new.
1 No. 0 Steam Pump. 2d hand.
2 Grindstones and Frames. New.
1 48 in. Blacksmith Forge. 2d hand.
1 Lot 15 in. Smoke-stacks. 2d hand.

Wood-Working Machinery.

1 Saw Table. New.
1 Double Saw Bench. New.
1 24-in. Surfacer Rotary Bed. New.
1 Band Sawing Machine. New.
1 Scroll " " "
1 Rod Machine. Self Feed. "
1 Sandpapering Machine. 2d hand.
1 8-in. Molder, 4 sides. 2d hand.
1 Edge Molding Machine. 2d hand.
1 Large Lot 2d-hand Pulleys, Hangers, &c.

And lot of others, both new and 2d hand.

If the list does not contain what you want, write us.

J. M. BADGER & CO.,
49 DEY STREET, New York City.

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HARDWARE AND STOVE
BUSINESS
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LONG ESTABLISHED. A CLEAN STOCK OF ABOUT $20,000. SATISFACTORY REASONS FOR SELLING.

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A pocket manual of useful information for Mechanical Engineers, Steam Users and Mechanics, containing 224 pages (set in Nonpareil type) of carefully selected data, formulæ and experimental investigations from the latest and most approved sources. Published by WM. A. HARRIS, builder of Harris-Corliss Steam Engines, Providence, R. I., to whom all subscriptions for copies should be sent.

Special Notices.

New & Second-Hand Machinery.

FEB. 21, 1883.

1 Engine Lathe, 14 in. x 4, 6, 7 and 8 ft Grant & Bogert
1 " " 26 in. x 12 ft., Grant & Bogert. New.
1 " " 48 in. x 16 ft. Good order.
1 " " 36 in. x 12 15 ft. New.
1 " " 42 in. x 14 ft. New.
1 " " 14 in. x 6 ft. Star Tool Co. New.
1 " " 14 in. x 6 ft. New.
1 " " 14 in. x 4 x 6 ft. New.
1 " " 16 in. x 7 ft. Bridgeport. New.
1 " " 13 in. x 5 ft. and 6 ft. Ames. New.
1 " " 16 in. x 6, 7 and 8 ft. Ames. New.
1 " " 18 in. x 8 and 10 ft. Lodge & Barker. New
1 " " 27 in. x 10 in. Lodge & Barker
1 " " 22 in. x 12 ft. New.
1 " " 20 in. x 10 ft. New.
1 " " 28 in. x 16 ft. New.
1 " " 24 in. x 12, 14 and 16 ft. New.
1 " " 11 in. x 4 ft. and 5 ft. Prentiss. New
1 " " 12 in. x 5 ft. Young. New.
1 Plain Engine Lathe, 16 in. x 4 ft. New.
1 " " " 15 in. x 4 ft. New.
1 Fox Lathe, 15 in. x 5 ft. Am. Tool & Machine Co.
1 15 in. x 4 ft. Turret Lathe. Lodge & Barker.
1 Fox Turret Lathe, 16 in. x 6 ft. Lodge & Barker. New
1 Planer, 60 in. x 60 in. x 17 ft. Good order.
1 " 32 in. x 32 in. x 7 ft. Good order.
1 " 16 in. x 16 in. x 3 ft. New.
1 " 22 in. x 20 in. x 5 ft. New.
1 " 24 in. x 24 in. x 6 ft. Hendey. New
1 " 26 in. x 26 in. x 7 ft. New.
1 " 15 in. Lever Table Drill. New.
1 Crank Planer, 16 in. x 16 in. x 13 in. New.
1 16-in. Upright Drill. New.
1 20-in. " Prentiss. New.
1 24-in. " Prentiss. New.
1 30 in. " Prentiss. New.
1 26-in. swing B. G. & S. F. Drill. Blaisdell. New
1 28-in. " " " "
1 38 in. swing, B. G. & T. F. Drill. New.
1 15-in. Shaper. Gould & Eberhardt. New.
1 10-in. Shaper. Gould & Eberhardt. New.
1 15-in. Shaper. Hendey. New.
1 24 in. Shaper. Hendey. New.
1 24-in. Shaper. Hendey. Good order.
1 9-in. Shaper. Bewes & Phillips. New.
1 9-in. Shaper. New.
1 14-in. Shaper.
Full Assortment of Milling Machines, Spindle Drills, &c., of Garvin's. New. [& Lamson.
1 each Nos. 2 and 4 Screw Machines, Wire Feed. Jones
2 No. 2 Lincoln Millers. Good order.
2 No. 2 Lincoln Millers. New.
1 Hand Lathe, 12 x 4, 5 and 6 ft. New.
1 Hand Lathe, 16 in. x 6 and 7 ft. New.
1 Boring and Turning Mill, 50 in. New.
1 Boring and Turning Mill, 72 in., 2 Heads. New.
1 each 3 and 7 spindle Nut Tappers. New.
1 Gig Saw. Good as new. Rogers.
1 700-lb. Steam Hammer. Ferris & Miles. Good order

New York Agency of
THE TANITE CO. and GRANT & BOGERT MACHINE TOOL WORKS,
H. PRENTISS & CO., 42 Dey St., N.Y.

For Sale.

The Industrial Works of Shamokin, owned and successfully carried on for a number of years by the late Wm. Brown, deceased, consisting of Foundry and Machine Shop, and a large stock of Patterns regarded as part of the property. Boiler Shop, Blacksmith Shop and Factory for the manufacture of heavy coal screens. Well located in the borough of Shamokin, Pa., with the best facilities for shipping by rail, and surrounded by a district contributing all the work that a shop of that kind can possibly turn out. Easy terms of payment are offered to suit a purchaser of limited capital. For list of Tools and further particulars apply to

WM. McILVAIN & SONS,
Manufacturers of Boiler Plate and Tank Iron,
Reading, Pa.

For Sale.

One Granulator, with attachments.
One large Mixer, with attachments.
One No. 5 Vacuum Pump.
Two sugar Packers.

The above is a portion of the Machinery formerly used at Baltimore Steam Sugar Refinery, Baltimore, Md. For information apply to

GEO. B. GRAHAM,
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For Sale.

Four second-hand Boilers, as follows:

One 53-inch diameter, 26 ft. 5 in. long.
" 36 " " 22 " " 4 " "
" 48 " " 24 " 7 " "
" 39 " " 24 " 2 " "

Will be sold cheap. Address
CHAS. K. LIPPINCOTT & CO.,
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For Sale.

A $4000 stock of Hardware, also building and lot. Good trade established. Will sell for cash at cost, freight added. Good reasons for selling. Location, Wayne, Wayne County, Neb. Splendid opening for parties wanting a Hardware stock.

Address at once. PEAVEY BROS.,
Sioux City, Iowa.

For Sale.

TWO BLOWERS, Alden & Dimpfel, 48 in. Will be sold cheap. For price, &c., address

SITES & GILL,
222 and 224 So. Third Street, Philadelphia, Pa.

For Sale—Lathes and Machinery.

15 in. x 6 ft. second-hand Engine Lathe, $175; 15 in. x 6 ft. Lathe, used two months, $200; 16 in. x 6 ft. new first-class Lathe, $275; 18 in. x 7 ft. new first-class Lathe, $330; 24 in. x 12 ft. new first-class Lathe, $500; Drill, and Lathe Chucks for same, very low. 20 in. Drill Press, new design, $100; 26 in. Back-geared Drill Press, new, $210; Planers, Planer Chucks, Hand and Power Presses, Nut Tappers, Bolt Cutters, Headers, &c. S. M. YORK,
Cleveland, Ohio.

TO INVENTORS
AND
MANUFACTURERS.

52d ANNUAL EXHIBITION

of the American Institute of the City of New York will open October 3d, 1883. Heavy machinery will be received as early as may be required; other goods, September 24th. Intending exhibitors must make early application to secure proper space and classification. For blanks and information, address

GEN. SUPT. AMERICAN INSTITUTE,
New York City.

ORDERS SECURED

For Hardware and other merchandise by a good Salesman, now manufacturing a small line pertaining to Window Blinds chiefly. Prefers to sell on commission to accepting salary of $10,000 (Ten Thousand Dollars per annum). With description of articles name lowest price for largest lots, where now selling, and extent of sales. Well posted in city, throughout the United States and Canada, and parts of Europe. Address Box 3465, Boston P. O., Mass.

Wanted.

A situation as Superintendent or Foreman in a Gray Iron Foundry. Light work preferred. Best of references.

C. H. W.,
Office of *The Iron Age*, 83 Reade Street, N. Y

TO RENT.

Desirable Offices, first and second floors, No. 267 So. 4th St., Philadelphia.

SCRIVEN & CONCANNON,
First Floor Back.

Trade Report.

BRITISH IRON AND METAL MARKETS.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, Sept. 19, 1883.

Scotch Pig.—The market continues weak, and prices have declined. We quote makers' brands as follows:

Coltness,	alongside,	Glasgow	57/6
Langloan,	"	"	58/6
Gartsherrie,	"	"	55/6
Summerlee,	"	"	56/6
Carnbroe,	"	"	54/6
Glengarnock,	"	Ardrossan	54/6
Eglinton,	"	"	48/6
Dalmellington,	"	"	48/6
Shotts,	"	at Leith	58/

Lighterage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—The market is a little firmer. Prices are unchanged. We quote as follows, f.o.b. shipping ports:

Middlesboro'	No. 1 Foundry	43/6
"	No. 2 "	41/6
"	No. 3 "	39/ @ 39/6
"	No. 4 Forge	38/

Bessemer Pig—Continues dull and weak. W. C. Hematites are quoted 49/ @ 50/ for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Blooms.—But little business doing.

Manufactured Iron.—There is a better feeling in the market and prices are a little firmer. We quote at works:

		£	s.	d.		£	s.	d.
Staff. Ord.	Marked Bars	7	10	0	@			
"	Medium "	6	5	0	@	6	15	0
"	Common "	6	0	0	@	6	5	0
Hoops, 20 W. G. and over.								
"	Common Best	7	0	0	@	7	5	0
"	Medium	6	5	0	@	6	15	0
"	Common	6	10	0	@			
Sheets, 20 W. G. and under.								
"	Ordinary Best	8	15	0	@	9	5	0
"	Common	8	0	0	@	8	5	0
Welsh Bars		5	5	0	@	5	7	6

Steel Rails.—There is an improved tone in the market and prices are steadier. Ordinary Sections are quoted £4. 15/ @ £5. 10/, f.o.b. shipping ports.

Iron Rails—Dull and nominal.

Old Rails.—The market is quiet and unchanged. Old T's are quoted £3. 5/, and D. H.'s, £3. 12/6 @ £3. 15/, c.i.f. New York.

Scrap.—The market is steady and quotations are unchanged. Heavy Wrought is quoted £3. 5/ @ £3. 7/6, c.i.f. New York. Bessemer Crop Ends are quoted 60/ for run of mill, f.o.b. shipping ports.

Copper.—The market is a little weaker and quotations are lower. We quote Best Selected £68 @ £69, and Chili Bars, £63. 5/ @ £63. 10/.

Tin—Is firmer. Straits Ingot, spot, quoted £94. 5/ @ £95, and futures, £94. 15/ @ £96.

Tin Plates.—The market is unchanged. We quote:

Tin Plates, 10 x 14,	1st qual.	Charcoal		19/6 @ 21/6
" "	2d "	"		18/6 @ 19/
" "	1st "	Coke		17/6 @ 18/
" "	2d "	"		16/ @ 16/6

Spelter.—The market is weaker and prices have fallen off a little. We quote Ordinary, at shipping ports, £14. 17/6 @ £15. 2/6.

Lead—Is quiet and unchanged. Common English Pig is quoted £12. 10/ @ £12. 15/.

Freights.—Steam from Glasgow to New York, 6/6 @ 7/; Liverpool to New York, 4/ @ 5/; Liverpool to Philadelphia, 5/ @ 6/6, and London to New York, 7/6 @ 9/6.

TRADE AND FINANCE.

Office of *The Iron Age*,
WEDNESDAY EVENING, Sept. 19, 1883.

In commercial circles the business of the week exhibits the same improving tendency more or less manifest for a fortnight past. The renewal of activity in the dry-goods jobbing trade has extended to other departments, although trade, as a whole, is tardy in its development. Merchants representing distant parts of the country are in the market, and current sales will make a respectable aggregate. The remarkable ease in money, the favorable condition of foreign trade, the heavy movement of crops toward the seaboard now in progress—the trunk lines being tendered more freight in the West than they are able to handle—are all factors contributing to a more cheerful feeling. At the same time it cannot be denied that the foreign market, as respects our surplus products, is not as satisfactory in the outlook as might be wished, and the drooping tendency of prices in grain and provisions has an unsettling effect in its bearing upon other staples and general merchandise. The effects are seen in the gross clearings of our city banks for the past week, and in those of leading cities throughout the country, the former showing a decrease of 27.5 %, compared with the corresponding week of last year, while there is a decrease of 5 % in the aggregate clearings of 27 leading points outside of New York. Due allowance must be made for the smaller volume of stock transactions this autumn, compared with last. The gains noticed are principally in the South and West, more particularly the former. The failures of the week numbered less than usual, but include that of A. & E. Wallach, of this city, who had invested heavily in machinery and tools for the manufacture of fancy leather; liabilities, $325,000, mostly held in Europe.

The weekly bank statement shows comparatively slight changes in the averages except for loans and deposits, which were increased respectively $1,202,500 and $3,019,100. The banks gained $749,075 in surplus reserve, and now hold $3,738,425 above the 25 % legal requirement, whereas in September a year ago they were deficient $1,000,000. The relatively strong position of the banks, together with the prospective Treasury disbursements in response to calls for bonds, also the increasing probability of gold imports at an early day, causes an easy feeling in monetary circles not usual at this season of the year. The Secretary of the Treasury to-day issued a call for $15,000,000 3 % bonds. On the 1st of September there were outstanding $305,529,000 of the 3 % bonds, and more than two-thirds of this sum being held as security for the national bank circulation, it will follow as a necessity that before long at least some small proportion of the latter must be canceled. We quote 60 to 90 days' indorsed bills receivable, 6 %; four months' acceptances, 6 @ 6½. Foreign exchange is dull and firm, and yesterday the posted rates for bankers' sterling were advanced to $4.83 for 60-day, and $4.86 for sight, in consequence of a scarcity of commercial bills. The advance is regarded as but temporary, leading bankers anticipating much lower rates next month, as the effect of increased exports. The action of the Bank of England in reducing its rate of discount ½ @ 3½ % is altogether exceptional at this time in the year, and must, in some degree, be ascribed to the quietness of speculation in nearly all branches of English trade. Among foreign bankers in this city a still further reduction is looked for, removing the only important obstacle to gold imports. The steamship Frisia, which arrived from Havre yesterday, brought $250,000 in gold.

On the Stock Exchange the market has been more active during the week, and prices generally have advanced. The exceptions are Ohio Central, Northern Pacific preferred, Denver and Rio Grande and Oregon Transcontinental. On Thursday the market was favorably influenced by the reduction of rates of discount by the Bank of England, and more encouraging news was received from "the corn belt." On Friday the Villard shares were severely attacked, weakening the whole list, but on the day following there was a recovery, the supposition being that certain large operators combined to sustain prices. On Monday the upward movement continued, the announcement of a bank failure in Montreal having little effect, while reports of an enormous freight business on Western railroads imparted strength. On Tuesday the market was agitated by bear raids, in which the Northern Pacifics and Oregon and Transcontinental suffered, but prices closed at a fractional advance.

The following were the quotations for Government bonds:

	Bid.	Asked.
U. S. 4½, 1891, registered	113	113¼
U. S. 4½, 1891, coupon	113	113¼
U. S. 4, 1907, registered	119	119¼
U. S. 4, 1907, coupon	120	120¼
U. S. 3 per cents	102⅞	103
U. S. Currency 6s, 1895	130	—
U. S. Currency 6s, 1896	131	—
U. S. Currency 6s, 1897	132	—
U. S. Currency 6s, 1898	133½	—
U. S. Currency 6s, 1899	134	—

The imports of foreign merchandise at the port during the past week were below the usual average, the total being but $7,601,097, of which $5,127,165 represents general merchandise, and the remainder ($2,473,932) dry goods. Since Jan. 1 the imports amount to $329,426,984, compared with $362,273,152 for the corresponding period of 1882. According to the Custom House reports, the importations of specie and bullion at this port during the week ending Sept. 14 were $262,357, nearly all in gold, and the exports of specie for the same time were $166,300. For a month past the difference between the amounts of specie imported and exported is insignificant. There was a fairly good export movement of domestic produce from this port during the past week, the total being $7,053,917, against $7,161,211 for the same week last year. The shipments of breadstuffs were very moderate, while the exports of provisions and petroleum are fair. Cotton is still moving out rather slowly. Since January 1 the exports amount to $254,253,580, compared with $239,672,532 for the corresponding period of 1882. The imports at New York for the month of August make a total of $41,643,196, which is about $5,000,000 below the corresponding month last year, but, with the exception of the previous two years, the imports of the month are large beyond precedent. For eight months from Jan. 1 the imports at New York form an aggregate of $316,314,597, against $340,000,000 in 1882, and $327,000,000 in 1881. The cash duties collected in August average much smaller than usual, some goods having been taken out of bond at much lower rates than were due when they were entered, and others with no duty at all, having been made free by the new tariff. Turning now to the outgoing commerce of the port, the exports make a total of $36,190,824, showing a gain in produce and merchandise of $1,000,000 upon the corresponding month of last year, although they have not been as large as for the same period of the preceding two years. Taking the last eight months together, the total exports, exclusive of specie, are $249,939,434, against $265,000,000 and $261,000,000 in the corresponding months of 1882 and 1881, respectively. From present calculations it is expected that the commerce of the whole country for the month of August will show a balance of several millions in our favor, and much more favorable than the returns for July.

The Importers' and Grocers' Exchange of New York has been organized in this city by the election of the officers and appointment of the several committees. The membership now numbers 220.

In the dry-goods jobbing trade a large demand has been in progress for the last two weeks, and there is an improved activity at all distributing centers West and South, but the "unmercantile condition of sales" is remarked upon as a consequence of excessive production. While many mills have stopped, the effect is largely counteracted by the refitting of many others with modern machinery, increasing their output. Coffee is steady on a basis of 10¢ @ 10¼¢ for Rio. Cotton is adversely affected by a decline in Liverpool. Wheat is depressed, owing to full receipts and slow export demand. Corn has declined on improved crop prospects. The provision markets broke badly, but are now dull and firmer. Lard is weak at a decline. Hides and leather are steady. Hemp is quiet; Manila firm at 10¼¢. Tobacco is held for higher prices. Wool is somewhat improved. Sugar is quiet on a basis of 6½¢ @ 6⅝¢ for raw. Petroleum is dull and the export demand light. In freights, room for grain for British ports shows a further slight rise on a better demand, stimulated in part by the lower range of grain values.

MINING STOCKS.

The closing prices for mining stocks were as follows:

	Bid.	Asked.
Amie	18	20
Alice	2.00	....
Alta Mont	2	....
Bodie	50	80
B. H. & E., n	¼	3-16
Bulwe	55	95
Bull Domingo	....	3
Barcelona	41	46
Bradshaw	22	25
Caled. B. H.	....	75
Climax	10	14
Con. Imp.	2	6
Con. Va.	42	47
Chrysolite	1.10	1.20
Central Arizona	25	....
Dahlonega	1	3
Durango	4	....
Dunkin	....	33
Decatur	....	2
Eureka Con.	....	8.00
East. Or.	38	50
Elko Con.	9	10
Father de Smet	3.70	4.25
Great Eastern	1	2
Green Mountain	65	....
Gold Stripe	6	10
Horn Silver	6 87½	7.25
Harlem	....	1.10
Hale & Nor.	....	3.25
Hortense	7	....
Hall-Ander.	1.25	1.30
Independence	....	55
Iron Silver	3.05	....
Lacrosse	7	10
Leadville Con.	40	44
L. Pittsburgh	60	64
L. Chief	70	72
Navajo	2.50	....
N. Standard	9	....
N. Belle	5.75	....
N. Belle Isle	....	50
Parnell	....	50
Ori. & Mil.	10	12
Pi e Line cer	1.14	1.14¼
Rappahannock	5	6
Robinson Con.	44	46
Rising Sun	1	3
Red Elephant	5	8
Standard	5.37½	5.75
Silver Cliff	10	14
Sutro Tun.	19	20
Sierra Gr.	1.10	1.15
Silver King	7.00	8.00
St. L. 1 & 4	2	....
Sonora Con.	28	29
Vizina	15	25

GENERAL HARDWARE.

At our last writing there was a good deal of anxiety felt as to the crop prospects, and the trade was holding back to see what the result would be, with the feeling that an unfavorable harvest would have a very depressing effect on business. During the week this uneasiness has in great part passed away, and the certainty of a fair harvest has reassured the timid. The effect has been that business is now going on about as before the scare. There are a great many goods selling in a quiet way, the aggregate of sales being larger than would be supposed, and, at least in many cases, than last year.

The supply of Nails is steadily diminishing under the strong demand, and local dealers experience increasing difficulty in filling orders. The New England factories which depend on water-power are still unable to run on account of the drouth, and Nails are shipped to that section from this market in considerable quantities. Assortments here are consequently badly broken, and dealers are obliged to buy or borrow from one another to supply their trade. Western competition has not made its appearance, and the present condition of affairs is expected to continue for at least the next 30 days. Prices are very firm at $3, less the usual abatement to large buyers. The meeting of the Atlantic States Nail Association, which was announced to take place at the Oriental Hotel, Coney Island, last Thursday, was held at the office of the Association, No. 218 Fulton street, this city, on account of the unpleasant weather which prevailed on that day. A large number of works were represented. The following dispatch from the Western Nail Association was read: "Meeting took no action regarding stoppage or card. Committee appointed to confer with you regarding extra sizes." On motion of Mr. McCormick it was resolved that the Executive Committee, to whom was referred the matter of extra sizes, be instructed to confer with the committee appointed by the Western Association in relation to same, and endeavor to arrange a uniform rate of extras on Nails. On motion of Mr. Wiston it was unanimously resolved that the present card of $3.10, less 10¢ ₱ keg for carloads, be reaffirmed.

We briefly stated last week that the File Manufacturers' Association held a meeting o

the 12th inst. at the Astor House, and advanced the factory price of first quality Files and Rasps to discount 40 per cent. instead of discount 45 per cent. We learn that the meeting was a full one, and that the best and most harmonious feeling prevailed.

Russell Jennings, of Deep River, Conn., has issued a circular, in which he says: "We wish to express our sincere thanks for the patience manifested during the time that we were unable to fill orders promptly, and we take pleasure in informing you that our facilities have been so increased that we are now able, and expect to be in the future, to fill orders without delay for all sizes of Auger Bits, from 4-16 to 16-16; and within a short time we shall be prepared to say the same with regard to large Bits, Car Bits, Dowel Bits, Machine Bits and every style of Augers and Auger Bits made by us."

We invite attention to the advertisement in another column of the Scott Manufacturing Company, of Baltimore, relative to "Ice Creepers," of which they manufacture two patterns—the "Safety" and the "Arctic." The peculiar feature of the "Safety" Creeper is that it can be worn the entire winter on the boot or shoe without once removing it, as it is simply reversed, or turned under the foot, on entering the house, thereby doing away with any possible injury to a carpet or to a polished floor. The "Arctic" Creeper is made of solid cast steel, with steel pins, and, on account of its durability, is largely used. Both of these Creepers are efficient for the purpose intended, and have been proved in use to be eminently practical. The motto of the manufacturers is "Semper Idem," which they intend shall symbolize the excellence as well as the uniformity of their goods. The following are the prices, which are net for quantities less than a gross; lots of a gross or more, discount 10 per cent.:

	Per gross.
"Safety" Ice Creepers	$25.00
Arctic " "	30.00

A special and peremptory sale of Hardware, Edge Tools, &c., is announced by E. Bissell & Co., wholesale auctioneers, for Wednesday, Thursday and Friday, September 26th, 27th and 28th. Full particulars of the sale will be found in their advertisement among "Special Notices."

The Keystone Hardware Works, Reading, Pa., will be offered at public sale on Saturday, November 3d. The sale will include Buildings, Machinery, Tools, Patterns, &c. Further particulars are given in the advertisement in "Special Notices."

IRON.

American Pig.—Sales in this market during the past week, so far as reported, do not aggregate half as much Iron as was sold here during the preceding week, and that was considered a period of remarkable dullness. There is no doubt that the present demand for Iron is very weak, but there are conflicting opinions in regard to the near future, which appears either cerulean or slightly roseate, according to the experience or temperament of the individual. It is asserted as ground for hopefulness that last September was a very similar month to the one which is now drawing toward its close, and that trade appeared unsatisfactory in volume and ominous in character until after the setting in of October, when there was a revival in the demand which continued far into the winter. On the other hand, it is argued that disturbing elements have appeared in trade which did not exist a year ago, that the decreased consumption of Iron will prevent any elasticity in surrounding conditions, and that demand and prices must continue to droop until time enables the country to recover its lost vigor. The situation is certainly one of great perplexity, and nobody anticipates any change in it until some time in October, when large buyers usually lay in Iron before the close of navigation. Prices will then depend upon the effect which the large stock of No. 2 Foundry and Gray Forge Irons will have upon the market. No. 1 Foundry is not held in excessive supply, but there is an abundance of the other grades. At present there is no indication of weakness in prices, which are held at about the same figures as before quoted, say, No. 1 Foundry, $22 @ $22.50 for Lehigh and North River Irons, with sales of special brands at $23; No. 2 Foundry, $19 @ $20.50; Gray Forge, $18.30 @ $19; White and Mottled, $17. Sales on the Metal Exchange during the past week footed up 1300 tons. The secretary of the Exchange now has reports from 108 furnaces, and states that their stock of Pig Iron on September 1 was 105,563 tons, against 113,134 tons on August 1; their production in August was 47,871 tons, against 46,157 tons in July. The following prices for 100-ton lots of Pig Iron, immediate delivery, for cash, are quoted us by furnace sales agents, lighterage in New York harbor being 60¢ ℔ ton, which should be added to Hoboken or other tidewater prices:

NO. 1 FOUNDRY.	
Hudson (free of lighterage at New York)	$22.75
Carbon (Hoboken delivery)	22.50
Thomas (Hoboken delivery)	22.00
Manhattan (tidewater)	23.00
Bushong (tidewater)	23.00
Olcott (at furnace, Albany)	22.00
GRAY FORGE.	
Durham (tidewater)	$18.75
Pequest (tidewater)	18.75
Sterling (tidewater)	18.50
Musconetcong (tidewater)	19.00

Scotch Pig.—Recent importations have been very moderate, and were absorbed upon arrival at current rates. There is more inquiry, and sales are reported of a considerable quantity of Glengarnock to arrive. The demand is generally very light, however, and there is no inclination to import in anticipation of business. Prices are so little above cost that 1/ for freight more or less effects a serious difference in profits to the importer, and freight rates evince a tendency to advance rather than to recede, which makes this branch of the Iron trade extra hazardous. We revise quotations as follows: Coltness, $23.25 from ship; Summerlee, $22.50 to arrive, and $23 from ship; Shotts, $23 @ $23.25 from ship; Langloan, $23.25 from ship; Gartsherrie, $23 @ $23.50 from yard; Glengarnock, $22.50 to arrive; Carnbroe, $22.50 to arrive, and $23 from yard; Eglinton, $21 from yard; Dalmellington, $20.75 to arrive, and $21 from ship.

English Pig.—There have been no recent transactions in Bessemer Pig in this market. Sellers quote $21 @ $21.50. The only sale of Middlesboro' Pig that has come to our notice is one of 500 tons Redcar, at private terms, to arrive.

Bar Iron.—The demand continues fair. Although no large transactions are reported, the supply of small orders is continuous. A good feature of trade is the ease with which collections are made, many buyers voluntarily paying cash. If present conditions were to continue for any length of time they would be regarded as healthy and satisfactory, if not as remunerative as might be desired, but there is unmistakable anxiety for the future, with so much unemployed capacity for production in the country. Prices are unchanged, Common Iron being especially stiff: Refined, $2.30 @ $2.40 from store, and $2 @ $2.20 from mill; Common, $2.10 @ $2.20 from store, and $1.75 @ $1.80 from mill.

Structural Iron.—No abatement is to be noted in the demand, which is very satisfactory. Prices are as follows: 3.5¢ for Beams, in round lots, on wharf, and 2.6¢ @ 2.8¢ for Angles, and 3.25¢ for Tees, out of store.

Plate Iron.—There is a fair trade. The demand is constant, and sales aggregate a satisfactory quantity. Consumers complain of a falling off of orders, however, and hesitate to pay top prices. Prices are therefore weaker, although nominally unchanged, as follows: Common, 2.6¢ @ 2.75¢; Refined, 2.75¢; Shell, 3⅛¢ @ 3¼¢; Flange, 4⅛¢ @ 4¼¢; Extra Flange, 5¢ @ 5¼¢.

Sheet Iron.—The demand is very good for all sizes, including Galvanized, and the prospects are favorable for a continuation of the present condition of the market. Prices range from 3.1¢ to 3.3¢ for Nos. 10 to 16, Black Sheets, according to quality and size of order. For prices of Galvanized and Light Sheets, see our New York Wholesale Price List.

Steel.—We have to report an improving trade. More purchasers are in the market, and regular customers are buying in larger quantities. Some establishments have booked more orders in the past week than in any similar period for a long time. We quote American Tool Steel, 11¢; Crucible Machinery, 6½¢ @ 7¢; Bessemer and Open-Hearth Machinery, 4¢ @ 5¢; Homogeneous Steel Plates, 5¼¢ @ 6¢; English Tool Steel, 15½¢.

Steel Wire Rods.—Some small sales have been made, but large buyers are not yet in the market. Quotations are nominally $50, duty paid. There is some inquiry for Siemens-Martin Steel Rods, which will perhaps lead to business. According to recent reports from Germany, the feeling among Rod makers there is improving, and prices are a little stiffer. As the demand for Rods has been very limited for some time, many German mills have turned their attention to the manufacture of Bar, Hoop and Band Iron, in which there is a good trade, and they are therefore not anxious to do much in Rods at the current low prices.

Steel Rails.—There is still a great deal of inquiry for next year's delivery, and we are reported a sale of 25,000 tons by an Eastern mill at current rates for delivery in 1884. Prices for winter and spring delivery are quoted as heretofore, namely, $37.50 @ $38 at Eastern mill, and small lots have been taken on these terms.

Old Material.—The movement continues very light. The supply of No. 1 Wrought, though limited, is evidently sufficient to cover the existing reasonable requirements. We hear of a sale of 200 tons Selected from yard at $24.50, but choice lots are held at $25, and are not pressed for sale at that. A lot of 300 tons was offered from ship at $22.75 with no takers, and was put into store. Quotations range from $24.25 to $25 for No. 1 from yard and $23.75 for shipment. A sale of 100 tons of extra good Car-wheels was made at a price equivalent to $19 at tidewater, but $19.50 is now asked for an additional lot. Old Rails are very difficult to quote, in the absence of open transactions, but they range from $23 to $23.50 at this point, with quantities held firmly at $24. Several hundred tons have changed hands in the past week on private terms. The following miscellaneous sales are reported: 100 tons Old Railway Leaf Spring Steel, $26.75; 100 tons Light Wrought Iron Scrap, $16.75; 100 tons Cast Iron Borings, $9.75. Crop and Bloom Ends are held at $23.50 from yard. Old Bessemer Steel Rails are offered for shipment at $25.75; Double Head Iron Rails at $25.50; Iron Bridge Rails at $24.50; Iron Fish Plates at $27.50.

TRANSACTIONS ON THE METAL EXCHANGE.

Thursday, September 13.	
100 tons American Pig, No. 1, Feb	$21.87½
10 " Straits Tin, Oct	.21
10 " " " Nov	.20¾
25 " " " Aug.-Sept. ship	.20⅞
15 " " " Sept. ship	20.85
10 " " " Nov	.21
Friday, September 14.	
100 tons American Pig, No. 1, Feb	$21.87½
100 " " " " "	21.87½
100 " " " " "	21.87½
10 " Straits Tin, Sept.-Oct. ship	.20¾
25 " " " " " "	.20¾
250,000 ℔. Lake Copper, Sept	.15¼
Saturday, September 15.	
10 tons Straits Tin, Sept	.20⅞
25 " " " Sept.-Oct. ship	.20¾
Monday, September 17.	
100 tons American Pig, No. 1, Oct	$21.62½
100 " " " " Nov	21.87½
Tuesday, September 18.	
100 tons American Pig, No. 1, Jan	$21.50
100 " " " " Feb	21.50
100 " " " " "	21.50
100 " " " " Dec	21.62½
100 " " " " "	21.50
100 " " " " Feb	21.50
25 " Straits Tin, Sept.-Oct. ship	.20⅞
Wednesday, September 19.	
100 tons American Pig, No. 1 Feb	$21.62½
10 " Straits Tin, June-July ship	.20.95
10 " " " spot	.21
25 " " " Sept.-Oct	.20⅞

METALS.

Copper.—The upward movement in Copper in this market, foreseen by all close observers, has at length been started without an effort, assisted in some measure by the generally better feeling in business circles, a feeling which, though manifesting itself later than some had hoped, seems to be all the sounder for it. These improved views as to business can hardly fail to exercise a powerful, stimulating influence on the metal trade, and Copper being the metal most favorably situated of all, feels, of course, the first effect of it. Lake Superior has improved to 15¼¢, cash, firm, after sales of some 200,000 ℔ at 15⅛¢, and other brands are worth 14⅜¢ @ 14¾¢. London cabled Best Selected £69 yesterday, and Chili Bars £63. 10/, while to day we receive the ensuing message: "Market a little weaker and quotations lower. Best Selected, £68 @ £69, and Chili Bars, £63. 5/ @ £63. 10/." Manufactures may be quoted as under: Bottoms, 24¢; Braziers, 24¢; Sheathing, 22¢, and Bolt Copper, 24¢. Messrs. James Lewis & Son, Liverpool, September 1, state: "The arrivals here from the United States during the past month amount to 1390 tons, Fine, of which 1182 are in Argentiferous Ore and Matte."

Tin.—The market was slightly set in motion again by a London quotation yesterday, of £94. 10/, Straits, but there is a lack of spirit, and we cannot quote Straits, spot, large lines, any better than 21¢. We are cabled to-day from London to the following effect: "Tin is firmer. Straits Ingot, spot, quoted £94. 5/ @ £95, and futures, £94. 15/ @ £96." L. and F. may be quoted 22¢, nominally. *Tin Plates.*—A good jobbing demand has prevailed, especially for Roofing Plates. We quote at the close, large lots, ordinary brands, ℔ box: Charcoal Bright, $5.62½ @ $6; do. Ternes, $5.12½ @ $5.37½; Coke Tin, $5.05 @ $5.15, and do. Ternes, $4.87½. Liverpool is about steady, at 15/9 @ 16/, Coke and Charcoal, 18/6 @ 20/. From London we are told per cable to-day that the market remains unchanged.

Lead.—Quite a large business has been transacted during the week under review, resulting in sales aggregating 1200 tons Common and Refined, part on dock, at various prices—$4.35, $4.32½ and $4.30, the market closing quite firm at $4.32½ for both Hard and Soft, while St. Louis ranges for both between $4 and $4.10. From London we learn to-day that the market remains unchanged. Manufactures are quoted as follows: Lead Pipe, 6¾¢; Sheet Lead, 7½¢; Tin-lined Lead Pipe, 15¢ ℔ ℔, and Block-Tin Pipe, 45¢, less the usual discount to dealers.

Spelter and Zinc.—Although not yet apparent through larger dealings, the improved opinion as to the immediate future of this metal has, if anything, been gaining ground during the week, and Common Domestic is now quite firm at 4½¢, with moderate sales thereat, while Silesian remains nominally 5⅛¢. *Sheet Zinc* is worth 6¢ @ 6⅛¢; Bertha Refined Spelter, 7¾¢ @ 8¢; and Bergenport, 9½¢. We receive from London the ensuing cablegram: "Market weaker. Prices have fallen off a little. Ordinary at shipping ports, £14. 7/6 @ £15. 2/6."

Antimony—Has been inquired for to a moderate extent only at 9⅛¢ Hallett, and 10¼¢ Cookson. Last London mail quotation, £38 @ £40 for French Star Regulus.

COAL.

The Anthracite Coal trade is in good condition, particularly as regards the domestic sizes, and the demand for manufacturing purposes is slowly improving. There is said to be little or no accumulation, although the business doing is largely on account of old orders. Most of the current deliveries are said to be at August prices, but for special brands of Lehigh and Schuylkill dealers claim to be realizing the latest circular. The official report of the Anthracite Coal tonnage carried by the different companies during the month of August shows a total of 3,324,711 tons—an increase of 430,008 tons over the same month last year; the total of all the companies for eight months of the year, 19,951,164 tons—an increase of 1,731,361 tons over the corresponding period in 1882, and this notwithstanding considerable inroads from the use of Bituminous for stove purposes. Doubts are expressed whether any additional advance will be proposed October 1, the feeling being that winter prices are already established. Bituminous Coal is dull, but somewhat improved.

The following is a *résumé* of current prices, from which it is usual to deduct for commissions:

FREE-BURNING STEAM COALS, F.O.B.

Lump.	Broken.	Chestnut.	Pea.
$3.90 @ 3.95	$3.90 @ 4.00	$4.50 @ 4.80	$2.85 @ 3.15

LEHIGH AND HARD WHITE ASH, F.O.B.

Lump.	Broken.	Chestnut.	Pea.
$4.90 @ 5.25	$4.35 @ 4.50	$4.50	$3.00

BITUMINOUS, ALONGSIDE.

Cumberland.	Clearfield.
$4.00 @ 4.25	$3.90 @ 4.00

To contractors the Pennsylvania Coal Company sells Pea at $2.70. The Pottsville *Miner's Journal* says: "As showing the improvement this year over last, it may be stated that, though the shipments to September 1 last year were only 600,000 tons in excess of the previous year, a suspension of six days had to be ordered to prevent accumulations at tidewater points. This year, when the shipments are over 1,500,000 tons greater than last year, there are no accumulations at the shipping points."

FOREIGN TRADE MOVEMENTS.

Included in the imports for the week ending September 14 were leading articles of merchandise valued as follows:

	Pkges.	Value.
Antimony	95	$5,086
Anvils	441	4,215
Brass goods	50	3,198
Bronzes	44	9,380
Chains and anchors	15	728
Clocks	108	9,821
Copper	...	27
Cutlery	119	45,372
Guns	198	26,086
Hardware	28	3,347
Iron, pig, tons	6,791	115,352
Iron, sheet, tons	191	9,231
Iron ore, tons	1,425	2,892
Iron tubes	3	365
Iron cotton ties	2,200	1,708
Iron, other, tons	1,468	37,975
Machinery	81	4,476
Metal goods	397	24,069
Nails	114	1,819
Needles	17	5,150
Nickel	11	3,345
Old Metal	..	530
Platina	2	6,328
Percussion caps	18	3,475
Pins	39	4,510
Plumbago	357	2,991
Saddlery	25	2,624
Steel	24,828	71,340
Tin, bxs	35,758	174,805
Tin, slabs, 3 499; lbs., 360,449	....	80,505
Wire	....	1,389
Zinc oxide	250	2,43[illegible]

The quantity of hardware and metals imported during the week compares with previous dates as follows:

	For the week.	37 weeks of 1883.	Same time 1882.
Cutlery, pkgs	119	5,696	5,378
Hardware, pkgs	28	805	705
Iron, R. R., bars	....	10,642	83,24[illegible]
Lead, pigs	.....	6,224	23,909
Steel, pkgs	24,828	2,348,329	1,470,331
Tin, bxs	35,758	1,402,568	1,647,265
Tin slabs, ℔	380,449	16,705,458	12,137,529

IMPORTS

Hardware.

Boker Hermann & Co.
Casks, 4
Cutlery and guns, pkgs., 90
Brown Bros. & Co.
Cases, 10
Burkinshaw W. C.
Cases, 9
Bloomfield J. C. & Co.
Machinery, pkgs., 24
Clark Mile End Co.
Machinery, cs., 3
Cadenas & Co.
Mach'y, cs., 3
Cordova G. de,
Machinery, cs., 2
Degrauw, Aymar & Co.
Chain, lengths, 6
Del. Bridge Co.
Old tools, bxs., 12
Drexel, Morgan & Co.
Cases, 11
Field Alfred & Co.
Cases, 36
Anvils, 30
Fuchs & Lang,
Machinery, pkgs., 45
Graef Cutlery Co.
Cutlery, cs., 4
Great Western Dispatch Co.
Tin plates, bxs., 491
Hall, Nicol & Granberry,
Cases, 2
Hartley & Graham,
Guns, cs., 7
Mdse., 18
Hoe R.
Mdse., case, 1
Kahn & Hanover,
Cases, 3
Luyties Bros.
Iron frame, 1
Merch. Disp. Co.
Cask, 1
Packages, 4
Arms, cs., 6
Moore J. B. & Co.
Wheels, 26
Moore's Sons J. P.
Arms, cs., 14
Moss F. W.
Files, csks., 4
Moseman & Bro.
Cases, 2
Oastler W. C.
Machinery, cs., 3
Packages, 3
Wheels, 4
Axle, 1
Parodi G.
Tools, cs., 2
Rothschild Bros. & Co.
Cases, 3
Runk, Unger & Co.
Machines, 2
Schoverling, Daly & Gales,
Mdse., cs., 17
Cases, 10
Arms, cs., 30
Schumacher Wm. & Co.
Mach'y, cs., 7
Starr Theo. B.
Casks, 2
Strauss, Blumenthal & Co.
Cases, 2
Venabb & Heymann,
Whipping machine, case, 1
Vom Cleff & Co.
Mdse., cs., 18
Ward Alsine,
Cutlery, cs., 5
Wiebusch, Hilger & Co.
Hdw. and cutlery, pkgs 24
Witte John G. & Bros.
Cases, 1
Order,
Packages, 11
Machinery, pce., 1
Guns, cs., 5
Casks, 2

Iron.

Baring Bros. & Co.
Wire rods, coils, 1078
Sheet, bdls., 404
Bond, Parsons & Co.
Pig, tons, 100
Brown Bros. & Co.
Bars, 16,894
Cortis R. J.
Wire rope, coils, 2
Coddington T. B. & Co.
Sheets, bdls., 477
Crocker Bros.
Spiegel, tons, 535
Pig, tons, 500
Foulke & Co.
Old iron, lot.
Lilienberg N.
Bars, 1636
Martin's metal, 10
Mason John W.
Wire rope, coils, 34
Naylor & Co.
Spiegel, cks., 319
Spiegel, cs., 150
Pierson & Co.
Sheets, bdls., 389
Pim, Forwood & Co.
Tubes, 576
Stays, 96
Fire bars, 330
Ventilators, 12
Valves, &c., lot.
Sherwood G. P.
Pig, tons, 100
Snow & Burgess,
Nail rods, bdls., 405
Williamson Jas. & Co.
Pig, tons, 600
Order,
Pig, tons, 1233
Sheets, bdls., 32
Spiegel, tons, 2190
Spiegel, cks., 132
Spiegel, lot, 1
Tubes, cs., 4
Cotton ties, bdls., 3800
Galv. iron, bdls., 42
Coiled rods, bdls., 287
Scrap, tons, 632
Rail ends, tons, 500

Steel.

Abbott Jere & Co.
Cases, 59
Brown Wm.
Bundles, 171
Cases, 8
Cary & Moen,
Coiled rods, bdls., 322
Cortis R. J.
Bundles, 300
Dolge A.
Wire, cks., 3
Downing, Sheldon & Co.
Bundles, 24
Bars, 4
Moss F. W.
Bundles, 87
Bars, 12
Case, 1
Plock & Co.
Car-wheel tires, 172
Tomlinson Spring Co.
Bundles, 25
Wagner W. F.
Plates, 64
Bundles, 37
Cases, 3
Order,
Steelware, pkgs., 127
Packages, 15
Bundles, 161
Rods, bdls., 1994
Rails, 2002
Bands, 163
Forgings, 88

Metals.

Baring Bros. & Co.
Tin plates, bxs., 1629
Bank of Montreal,
Tin plates, bxs., 800
Tin and terne plates bxs., 512
Brown Bros. & Co.
Plumbago, bbls., 880
Cort N. L & Co.
Tin plates, bxs, 4989
Dutton E. P. & Co.
Stereo. plts., bxs., 2
Foote Emerson,
Mdse., cs., 10
Foulke & Co.
Old metal, bbls., 4
Hollander F. & Co.
Metalware, cs., 10
Ketchum E.
Tin plates, bxs., 500
Merrick C. S & Co.
Tin plates, bxs., 110
Meyer G. A. & E.
Zinc oxide, csks., 250
Montell F. T
Brass, bbls., 5½
Lead, bbl, 1
Copper, bbl., 1
Moore J. B. & Co.
Plumbago, bbls., 149
Phelps, Dodge & Co.
Tin plates, bxs., 5222
Tin taggers, bxs., 17
Strauss A. D.
Copper shoe tacks, cs., 4
Venabb & Heymann,
Worked tin, cs., 12
Order,
Tin plts., bxs., 5,211
Tin taggers, bxs., 110
Old copper pipes, lbs., 800
Terne paltes, bxs., 713
Tin and terne plates, bxs., 54
Plumbago, 1193

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending September 18, 1883.

	Quan.	Val.
Danish West Indies.		
Cutlery, case	1	$75
Hdw., pkgs	10	120
Scales, cs	5	75
Ptlm., gals	1720	181
Pipe, feet	137	25
Ag. imp., pkgs	2	90
Dutch East Indies.		
Ptlm., gals	762,500	75,705
Rotterdam.		
Copper, cakes	146	3,606
Pumps, pkgs	22	1,345
Elsinore.		
Ptlm., gals	850,394	67,952
Hamburg.		
Ptlm., gals	644,354	51,550
Mach'y, pkgs	26	2,546
Knit. ma., cs	41	4,210
Hdw., pkgs	50	1,566
Mf. iron, pkgs	63	515
Sew. ma., cs	1646	24,241
Saws, case	1	100
Pumps, pkgs	31	10,250
Clocks, pkgs	98	3,386
Copper, cks	9	1,802
Metal foil, cse	1	241
Copper, bars	550	3,683
Antwerp.		
Zinc ashes, cks	5	80
Hdw., pkgs	47	1,067
Sew. ma., cs	86	2,318
Copper, bars	101	4,885
Dantzic.		
Ptlm., gals	213,950	16,100
Copenhagen.		
Hdw., pkgs	5	277
Mf. iron, pkge	1	69
Pumps, pkgs	4	200
Bremen.		
Ptm., gls	1,447,037	114,434
Mach'y, pkgs	2	50
Ag. imp., pkgs	51	416
Hdw., pkgs	46	1,303
Irons, cs	50	238
Cop. mat., bgs	1136	18,000
Tinplates, cs	6	60
Sew. ma., cs	26	423
Mf. iron, pkgs	14	349
Stettin.		
Ptlm., gals	611,346	44,939
Liverpool.		
Clocks, pkgs	575	12,079
Mach'y, pkgs	112	26,068
Mf. iron, pkgs	39	856
Hdw., pkgs	49	1,884
Cop. ore, cks	1724	16,750
Platina, case	1	5,300
Pumps, pkgs	22	1,085
Ag. imp., pkgs	4	102
Rifles, cs	200	42,000
Met'l g'ds, cs	8	600
Burners, cs	3	137
Br. goods, cs	33	500
Glasgow.		
Hdw., case	1	20
Scales, cs	70	5,168
Mf. iron, pkgs	10	250
Tacks, case	1	75
Sew. ma., cs	320	5,687
Clocks, cs	7	226
Ag. imp., pkgs	9	465
Boilers, pkgs	30	741
W. mills, cs	4	70
Hull.		
Clocks, cs	8	153
Hdw., cs	75	1,250
Sew. ma., cs	601	5,858
Gibraltar.		
Ag. imp., cs	2	30
Dublin.		
Ptlm., gals	123,939	10,870
Nova Scotia.		
Revolvers, cs	2	222
Ag. imp., pkgs	20	67
Ptlm., gals	37,250	3,900
Mf. iron, pkgs	3	40
Hdw., pkgs	26	470
Stmpdwre, pkgs	10	180
London.		
Ptlm., gals	381,321	34,317
Mach'y, pkgs	13	5,000
Mf. iron, pkgs	6	97
Rifles, cs	2	301
Scales, cs	13	295
Clocks, pkgs	220	4,200
Hdw., pkgs	120	2,319
Bristol.		
Hdw., case	1	25
British West Indies.		
Ptlm., gals	26,425	2,762
Nails, kegs	149	596
Cutlery, cs	2	20
Mach'y, pkgs	13	221
Iron, bdls	8	35
Guns, cs	3	44
Nails, kegs	5	25
Mf. iron, pkgs	224	1,151
Sew. ma., cs	5	131
Hdw., pkgs	28	295
Scales, case	1	13
Axles, case	1	40
Nails, bxs	14	91
Pistols, case	1	60
Ag. imp., pkgs	15	94
Brass g'ds, cse	1	24
Newfoundland.		
Burners, case	1	28
Sew ma., cs	10	54
Mach'y, pkgs	10	762
Mf. iron, pkgs	4	127
Clocks, cs	11	127
Scales, cs	3	40
Ag. imp., pkgs	31	83
New Brunswick.		
Ptlm., gals	31,946	3,412
British Guiana.		
Ptlm., gals	8000	720
Scale, case	1	39
British East Indies.		
Ptlm., gals	463,140	46,314
British Possessions in Africa.		
Ptm., gals	79,210	8,731
Ag. imp. pkgs	39	606
Hdw., pkgs	46	522
Havre.		
Hdw., pkgs	8	162
Copper, casks	243	48,750
Copper, bars	18	800
Ag. imp., pkgs	27	1,865
Cette.		
Ptlm., gals	284,843	20,007
French West Indies.		
Ptm., gals	5000	463
French Possessions in Africa.		
Ptlm., gals	165,500	14,000
Alicante.		
Ptlm., gals	238,774	20,825
Bilbao.		
Ptlm., gals	110,600	10,000
Naples.		
Mf iron, pkge	1	50
Leghorn.		
Knit. ma., cse	1	36
Lisbon.		
W. mills, cs	13	703
Mf iron, pkge	1	8
Clocks, cs	140	2,003
Genoa.		
Pumps, pkgs	13	148
Hayti.		
Ptlm., gals	1720	286
Cot. gins, case	1	64
Scales, cs	2	17
Trieste.		
Ptlm., gals	786,820	68,100

	Quan.	Val.
Seville.		
Ptlm., gals	171,700	15,550
Constantinople.		
Ptlm., gals	169,230	14,010
Smyrna.		
Ptlm., gals	199,000	17,413
Cuba.		
Ptlm., gals	2862	539
Pumps, pkgs	11	710
Spikes, drums	127	300
Scales, cs	73	710
Meters, cs	11	315
Car sprngs, pge	1	153
Valves, case	1	111
Nails, cs	86	255
W. mill, pkgs	8	71
Cutlery, cs	12	90
Iron safes	2	125
Bar steel, bdls	15	201
Iron, pkgs	471	660
Copper, pkgs	20	2,662
Car wheels	100	1,012
Mf. iron, pkgs	906	4,908
Hdw., pkgs	359	3,789
Mach'y, pkgs	376	27,874
Sew. ma., cs	87	1,826
Tacks, cs	5	65
Clocks, cs	4	138
Tubes	125	266
Saws, cs	3	135
Bell	1	50
Boiler	1	2,100
Ag. imp., pkgs	14	213
Nails, kegs	25	84
Nails, pkgs	13	220
San Domingo.		
Mf. iron, pkgs	45	1,255
Ptlm., gals	800	108
Hdw., pkgs	1	36
Uruguay.		
Hdw., pkgs	2	35
Ag. imp., pkgs	106	1,265
Ptlm., gals	50,000	5,410
United States of Colombia.		
Mf. iron, pkgs	192	1,777
Hdw., pkgs	181	5,722
Sew. ma., cs	150	3,501
Scales, cs	19	260
Shoe nails, cs	2	35
Car wheels	100	1,300
Saws, cs	7	235
Cartridges, cs	78	1,044
Pistols, cs	6	343
Pumps, pkgs	7	327
Spikes, kegs	28	129
Propell'r wh'ls	2	262
Chains, pkgs	6	263
Mach'y, pkgs	96	4,519
Cutlery, cs	104	4,768
Ptlm., gals	6605	897
Clocks, cs	18	415
Tin plate, bxs	7	72
Iron, pkgs	132	1,373
Mf. cop., cs	2	41
Iron safes	8	1,065
Ag. imp., pkgs	21	355
Firearms, cs	14	3,944
Nails, kegs	60	102
Copper, cs	12	207
Iron stairway	1	480
Zinc, pkgs	4	59
Pr. goods, cse	1	20
Tacks, cs	1	27
Shot, cs	4	60
Central America.		
Ptlm., gals	11,538	1,394
Mach'y, pkgs	3	63
Mf. iron, pkgs	968	7,120
Cutlery, cs	32	1,221
Wheels and a., pkgs	10	121
Clocks, cs	5	91
Scales, cs	12	168
Ag. imp., pkgs	24	265
Br. g'ds, case	1	54
Metal, case	1	74
Sew. ma., cs	68	1,215
Hdw., pkgs	60	1,110
Iron tank	1	42
Mf. cop., case	1	38
Nails, kegs	85	301
Tacks, cs	2	19
Zinc, casks	2	66
Cartridges, cs	3	81
Loco. tender	1	165
Shot, bags	4	27
Mexico.		
Hdw., pkgs	38	1,650
Ag. imp., pkgs	13	120
Casters, cs	2	25
Clocks, pkgs	29	385
Scales, cs	23	342
Cartridges, cs	4	172
Cutlery, cs	11	551
Printing material, pkgs	8	506
Plumbing material, pkgs	9	304
Ptlm, gals	26,900	2,694
Sew. ma., cs	87	1,920
Mf. iron, pkgs	146	1,363
Pistols, cs	3	1,028
W. closets	2	135
Firearms, cs	3	309
Brake fix., cs	3	1,340
Mach'y, pkgs	12	2,150
P. caps, cs	10	575
Pumps, pkgs	10	255
Nails, kegs	62	223
Venezuela		
Mf iron, pkgs	51	672
Mach'y pkgs	8	295
Hdw., pkgs	33	569
Ptlm., gals	5402	673
Sew. ma., cs	35	1,135
Cutlery, cs	7	309
Clocks, case	1	49
Nails, bbls	15	51
Pumps, pkgs	6	236
Alexandria.		
Ptlm., gals	346,140	30,754
Brazil.		
Ptlm., gals	239,055	23,896
Mach'y, pkgs	30	1,923
Saws, cs	3	53
Car wheels	382	7,595
Mf. iron, pkgs	28	2,002
Iron pipe, pcs	144	116
Nails, kegs	12	36
Firearms, cs	11	1,050
Revolvers, cs	2	210
Rifles, cs	5	216
Nails, cs	63	370
Tacks, cs	52	345
Iron safe	1	113
Scales, cs	3	71
Sew ma., cs	87	1,456
Ag. imp., pkgs	44	711
Hdw., pkgs	207	3,368
W. rope pkgs	2	108
Cartridges, cs	7	139
Bells, cs	3	215
Clocks, cs	30	58
Pumps, pkgs	10	525
Cutlery, cs	136	1,927
Cotton gins, cs	2	175
Porto Rico.		
Iron safe	1	360
Hdw., pkgs	2	100
Ptlm., gals	1000	180
Iron, pkgs	45	549
Ag. imp., pkgs	2	48
Mach'y, pkgs	279	5,132
Steel, bdls	9	88
Japan.		
Hdw., pkge	1	50
China.		
Mf. iron, pkgs	8	105
Ag. imp., pkgs	2	12
Sandwich Islands.		
Mach'y, cs	5	1,503
Hdw., cs	3	162

OLD METALS, PAPER STOCK, &c.

The purchasing prices offered by dealers are as follows:

Copper, heavy	₽ lb.	$0.12	@	.....
" light	"	.10½	@	.....
Copper Bottoms	"	.10	@	.....
Yellow Metal	"	.07½	@	.....
Brass, heavy	"	.09	@	.....
" light	"	.07	@	.....
Composition, heavy	"	.11	@	.11½
Lead, heavy	"	.04	@	.....
Tea Lead	"	.03½	@	.....
Zinc	"	.03	@	.....
Pewter, No. 1	"	.14	@	.....
" No. 2	"	.10	@	.....
Wrought Iron	₽ ton.	22.50	@	.....
Light "	"	12.00	@	13 00
Stove Plate "	"	11.50	@	12.00
Machinery "	"	14.50	@	15.00
Grate Bars	"	4.50	@	.....
Stereotype Plates	₽ lb.	.04½	@	.05
Electrotype "	"	.04¼	@	.04½
Small Type	"	.05	@	.05

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

Canvas, Linen	₽ lb.	3½c.	@	4 c.
White Cotton, New	"	3½c.	@	.....
" No. 2	"	2½c.	@	2¼c.
White, No. 1	"	3¾c.	@	4 c.
" No. 2	"	1¾c.	@	2 c.
Seconds	"	½c.	@	1 c.
Soft Woolens	"	5 c.	@	6 c.
Mixed Rags	"	1½c.	@	1¾c.
Gunny Bagging	"	1½c.	@	.....
Jute Butts	"	1¼c.	@	.....
Kentucky Bagging	"	.....	@	3¾c.
Book Stock	"	1¾c.	@	2 c.
Newspapers	"	1 c.	@	.....
Waste Paper and Scraps	"	½c.	@	.....
Kentucky Bale Rope	"	3½c.	@	4

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Sept. 18, 1883.

Pig Iron.—The market has been very quiet during the week, and prices are again a shade easier. No special efforts are being made to force sales, but offers at 25¢ @ 50¢ ₽ ton below recent figures are not likely to be refused when made by good buyers. The supply of Iron is not excessive, but the fact that prices are weakening shows, nevertheless, that the supply is in excess of the demand. Consumers are buying so carefully, however, and are carrying so little stock, that the position may possibly be better than appearances would indicate. In fact, it is generally believed that, outside of what is being carried by the furnaces, there has seldom been a time when so little stock was in second hands as to-day. This is about all that can be said in favor of the market, the demand being dull and dragging, and entirely devoid of that feeling of confidence which is characteristic of a healthy trade. It is difficult to see how prices can go any lower, but, in spite of theories to the contrary, the tendency is steadily in that direction. All descriptions are weak, but prices of No. 1 Foundry have been shaded more than any other grade. Nominally there is not much change in quotations, but brands which were held firm some time ago at $23 @ $23.25, are now easily available at $22.50. Mill Irons are easier to buy, but, as a rule, are not quoted much below the figures given eight or ten weeks ago, but buyers of large lots can, in many cases, do better by half a dollar per ton than during July and the early part of August. There is very little disposition to bid for large lots, however, and while it seems impossible for any material break in prices to occur, buyers are just as cautious as though Iron was several dollars per ton higher than it is. The extreme range of prices is about as follows: No. 1 Foundry, $22 @ $23; No. 2 Foundry, $19.50 @ $20.50, delivered, Philadelphia; Gray Forge, $17.50 @ $19, f.o.b. cars at furnace. Sales, as already mentioned, have been confined to small lots prompt delivery; buyers of large lots forward delivery would, in the majority of cases, be able to shade the above prices according to circumstances.

Foreign Iron.—There is very little demand for Bessemer, and only small lots have been sold from $21 to $21.50, according to quantity, shipment, &c. Buyers of 5000-ton lots and upward appear to have entirely withdrawn from the market, although $21 could doubtless be shaded on firm offers. Spiegeleisen is weak and lower, with sales of 1000 tons 20 % at $30.12½ for shipment to Baltimore, now held at $31 in consequence of higher freights.

Blooms.—Market a trifle steadier, and while sales have been made at less money, sellers of good brands are realizing about the following rates: Charcoal Blooms, $57 @ $58; Run-out Anthracite, $47.50 @ $49; Scrap Blooms, $42 @ $44; Northern Ore Blooms, $39.50 @ $41.50.

Muck Bars.—Market rather quiet, but for good qualities prices are steady. Sales have been made chiefly at $34 at mill, although in some cases we hear of slightly lower figures.

Bar Iron.—The market remains very much in the same condition as reported for several weeks past. There is a good deal of business doing in a small way, and many of the mills have all the work they can handle at about 2.2¢ for Best Refined Iron. At the same time, there are many complaints of irregularity in prices and the extremely small orders which are given from time to time. Buyers seem determined to trade from hand to mouth, however, and, unless to cover actual requirements, it is impossible to secure orders of any importance, and in such cases very low prices are expected. It is difficult to quote prices with any definiteness, as much depends on quantity and quality required and specification of sizes. Outside the city 2.1¢ at mill is said to be a bottom quotation for first-class Iron, but orders can be placed at a good deal less when stipulations as to quality are not very strict. On the whole, it may be said that the market has held its own during the week, and prices are about steady as above quoted.

Plate and Tank Iron.—The firmness and scarcity noted in recent reports is steadily maintained, and prices are very firm as last quoted. There is not a great deal of business around, but there is rather more than can be taken for early delivery, quite a number of small orders being held in abeyance until they can be placed without advancing prices. In the meantime quotations are firm as follows: Tank Iron, 2.5¢; Boat Plate, 2.35¢ @ 2.4¢; Shell, 3¢ @ 3.25¢; Flange, 4¢ @ 4.25¢, and Fire-Box, 5¢ @ 5.5¢.

Structural Iron.—There has been less inquiry this week, and, with the exception of one order for about 600 tons bridge work, there has been very little new business given out. Manufacturers are very much pushed to make deliveries as rapidily as required, however, and there is plenty of work to occupy them for some time to come. Prices are steady as last quoted, viz.: Double-Refined Bars, 2.5¢; Bridge Plates, 2.5¢; Angles, 2.3¢ @ 2.4¢; Tees, 2.8¢ @ 3¢; Beams and Channels, 3.5¢.

Sheet Iron.—The demand for Thin Sheets has been well maintained, although the low numbers are rather quiet. Something more than an average business has been done to date, however, and prospects indicate that the entire product of the mills will be required before the close of the year, particularly Thin Sheets. Prices are steady and for small lots about as follows:

Common Sheets, No. 28	4½¢
Common Sheets, Nos. 26 and 27	4¼¢
Common Sheets, Nos. 21 to 25	4 ¢
Common Sheets, Nos 18 to 20	3¾¢
Best Refined, ¼ % advance on the above.	
Best Bloom Sheets, Nos. 26 to 28	6½¢
Best Bloom Sheets, Nos. 22 to 25	6¾¢
Best Bloom Sheets, Nos. 16 to 21	6 ¢
Common Red Plates, 3-16 to 16	2.7¢
Best Bloom, Galvanized, discount	40 %
Second quality, discount	50 %

Wrought Iron Pipe.—There has been a fair demand for small lots, but business in a large way is limited. The general tone of the market is decidedly weak and irregular. The following prices may be given as representing the retail market, say 60 % off list price on Boiler Tubes and 75 % off on Gas and Steam Pipe, but on large or desirable orders buyers are able to obtain considerable concessions from the above quotations.

Steel Rails.—We are not able to report any sales of importance, buyers still holding off in hopes of something turning up in their favor. Sales of lots of a few hundred tons each are made from time to time at $37.50 @ $38, but offers for large lots are difficult to obtain, although there is every reason to suppose that $37 would be shaded on firm offers from good buyers. There is a general disposition to wait, however, and sellers, seeing that efforts to force business would only weaken prices without increasing the demand, are not quoting less than $37 @ $38; buyers' ideas supposed to be not over $36.

Old Rails.—There have been several inquiries, but no sales have been made for delivery in this vicinity since the 1500 tons mentioned last week. One or two lots have been offered at $23.25, with bids of $23.12½, but negotiations appear to have fallen through. A lot of 30-lb rails was sold from a road in Western Pennsylvania at $23.5c, Pittsburgh, but beyond this no sales have been reported Prices seem to be a shade easier, with $23.50 asked for Philadelphia deliveries.

Scrap Iron.—There is a fair demand, and, with only very moderate offerings, prices are well maintained. Cargo lots, about $23.50, and selected yard lots, No. 1, $25, f.o.b. cars.

Nails.—There is no change to note. Demand is good, and, under light stocks, prices rule steady at $3, with slight concessions to large buyers.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., Sept. 16, 1883.

There has been no important change in general business during the week; possibly the feeling is not quite so good as it was a week ago, owing to reports of the recent frosts having damaged the crops, corn in particular, in different parts of the country, but the fact that corn has declined 3¢ @ 5¢ ₽ bushel at Chicago within the past day or two is good evidence that the first reports were greatly exaggerated. On the whole, the outlook to-day is not as encouraging for the fall trade as it was a month ago, though there are indications of a more healthy feeling and improvement in general business before the close of the present month. The complaint made by Iron men is not so much a want of business as unremunerative prices. Raw Iron is being sold at about cost of production, and the products are doing but little better. For some years past the capacity for production has been increased beyond the wants of consumption, and to this overproduction may be attributed, in the main, the present unsatisfactory condition of the Iron market.

Pig Iron.—There has been no improvement in demand during the past week; consumers are still holding back, refusing to buy beyond immediate actual wants, and prices are weak and in buyers' favor. The very best brands of Mill may be quoted 50¢ ₽ ton lower, as compared with prices of a month ago; some furnaces are refusing to make any concession, being pretty well sold ahead; but others, less fortunate, not desiring to blow out or bank up, are offering to sell at the reduction, and we are cognizant of a sale within the past three days at the decline. Consumption in Pittsburgh at the present time is probably larger than ever before, but very few of the mills have any stock to speak of, and home furnaces have orders sufficient to absorb their production, and consequently have no accumulation. The stock in first hands in the Shenango and Mahoning Valleys is reported to be small. The offerings from points at a distance continue meager; Eastern furnaces can do better at home than in this market, and the same is true of most of those west of Pittsburgh. We quote prices as follows:

No. 1 Foundry	$21.00 @	$22.00,	4 mos.
No. 2 "	19.00 @	20.00,	4 "
Neutral Mill	17.00 @	18.00,	4 "
All-Ore Mill	19.00 @	20.00,	4 "
Warm-Blast Charcoal	25.00 @	28.00,	4 "
Cold " "	28.00 @	33.00,	4 "
Bessemer Iron	20.50 @	21.50,	4 "

Muck Bar—Is fairly active, but prices are weak; sales at $33 @ $33.50, cash; a lot of 500 tons reported sold at inside quotations. There has been more inquiry within the last couple of months than for several years preceding. Some mills are working almost entirely on Muck, while others are buying, claiming that they can buy cheaper than they can make it. We are cognizant of contracts of this character. One mill furnishes the Pig Iron and pays another mill so much per ton for converting the same into Muck Bar. Some mills have not puddling capacity sufficient to keep them going when working up to their full capacity.

Manufactured Iron.—The general position of the market remains much the same as noted a week ago; business is fairly active, mills are nearly all in operation, some of them are pretty well supplied with orders, but all complain of unremunerative prices. Prices are still quoted on a basis of 1.85¢ @ 1.9¢ for well-assorted orders, usual terms; all Bars can be bought under 2¢.

Nails.—The demand continues light for the season, which may be attributed to an impression on the part of some of the largest buyers that prices have not yet reached the lowest point, and they are holding back in consequence, or buying only as actual wants require. The stock both in first and second hands continues light, and, this being the case, it is not likely that any action as regards production will be taken by the Western Association until the next regular monthly meeting, which takes place on the second Wednesday of October. Prices remain as last quoted—$2.70 @ $2.75, 60 days, 2 % off for cash, in carload lots, and $2.85 @ $2.90 in smaller lots.

Wrought Iron Pipe.—The demand is rather better, but there has been no improvement in prices, and as the season is becoming pretty well advanced, the prospect as regards the latter is not very promising. This has been a bad year for Pipe manufacturers, and the prospect for an improvement in price between now and the 1st of January is not very encouraging. Discount on Gas and Steam Pipe, 70 and 10 @ 75 %; on Boiler Tubes, 57½ @ 60 %; Oil Well Casing, 43¢ @ 45¢ ₽ foot; do. Tubing, 14¢ @ 15¢.

Steel Rails.—The mills here are very busy for this month and next, but are open for engagement for November and December. We quote for near-by delivery at $39, cash, at mill; for November and December, about $1 less.

Old Rails.—The offerings continue light, but the demand is less urgent, and in the absence of sales we continue to quote at $24, although some of the brokers think they could obtain 50¢ more for standard brands for immediate delivery. There have been no foreign Rails sold here to speak of since last winter.

Railway Track Supplies.—There is a fair business at unchanged prices. Railway Spikes, 2.6¢, 30 days; Splice Bars, 1.9¢; Track Bolts, 3¢ with square and 3.2¢ @ 3.25¢ with hexagon nuts.

Steel.—The Merchant Steel trade continues quiet, with prices weak, but without quotable change. Standard brands Refined Cast Steel, 11¢ @ 12¢ ₽ lb; Crucible Machinery, 6¢ @ 7¢; Bessemer and Open-hearth do, 4¢ @ 5¢; Bessemer Billets, $40 @ $43. The Black Diamond Steel Works are now engaged in making, for an Ohio River towboat, the largest steel shafts ever made in this country.

Crop Ends.—There have been no sales either in American or foreign reported here for months; there is no demand for them, consumers being well supplied. American are still being offered at $23.50; foreign could not be sold under $25.50 @ $26, according to prices at the seaboard.

Scrap.—There is not much doing, and prices remain about as last quoted: No. 1 Wrought, $21 @ $20, net ton, for Ordinary, and $23 for Selected Railway; Wrought Turnings, $16 @ $18; Old Car Axles, $32 @ $33; Old Car Wheels, $19 @ $20, gross; Cast Borings, $13 @ $14.

Coke.—There is an increasing demand. Operators are beginning to complain of a scarcity of cars, but prices remain unchanged. We continue to quote at $1 ₽ ton, free on cars at ovens, in a regular way, and $1.10 for small foundry orders.

Window Glass.—No change in prices; business only fair for the season. Discounts, 60 and 20 % on Single, and 70 and 5 % on Double Strength, in carload lots.

CHICAGO.

Office of *The Iron Age*, 16 and 18 Clark St., Cor. Lake St., CHICAGO, Sept. 17, 1883.

Hardware.—In the Hardware trade seasonable goods are fairly active. Orders are not confined to any particular locality, but cover a large area, which means that the recent scare in regard to frosted crops, so wildly circulated, was greatly exaggerated, and that the business prospects throughout the Western agricultural districts have suffered very little so far. Country merchants are not buying heavily, but duplicating their orders at short intervals. While trade is in a healthy condition and prices reasonably well sustained, there are evidences of mistrust and considerable hesitation in placing large orders for any kind of goods. The principal lines in special demand are Stove and Sheet-Iron Ware and Builders' Light Hardware, which command fair prices. It is noted, in fact, that prices are firmer, and that there are indications of an upward tendency, in a general way, on all lines of Hardware.

Nails—Are in fair request and stocks are considerably broken. It is stated that there are very few stocks in this market that are complete in sizes, and still less from which an order for any great amount could be filled. We hear complaints that manufacturers are slow to fill jobbers' orders, and on some sizes are very much behind. While consumers are looking for lower prices, manufacturers are hinting that a further decline from to-day's quotations, will cause a suspension. In the opinion of consumers, Nails are too high, compared with other Iron, and their effort this week to break prices resulted in forcing carload lots to $2.85 ₽ keg, and less quantities to $3 ₽ kg, which price is not firm.

American Pig.—The position of the Pig Iron market is much the same as last week. Consumers adhere to their policy of small lots and frequent purchases, in anticipation of lower figures. Prices for Southern Coke Irons are regarded as being weak, and furnacemen are disposed to push sales when possible. Lake Superior Charcoal is in fair demand and is held with more firmness at to-day's quotations than other brands. The aggregate sales of one week compared with another show very little variation for the last month or six weeks. We quote Lake Superior Charcoal, Nos. 1 and 2, at $25; and Nos. 3 to 6 at $24 @ $25, 4 mos., Briar Hill, $24; Himrod, $22.50; Crane, No. 1, $25; No. 2, $24; Thomas, $23 @ $26.50; Duval, No. 1, $23.50; No. 2, $22.50; Fulton Notch, No. 1, $22.50; No. 2, $22.50; Southern Coke, No. 1, $22.50; No. 2, $21.50; Low Moor, No. 1, $23.25; No. 2, $22, 4 mos.; Silvery Soft, $21 @ $22.50; Ashland, No. 1, $23; No. 2, $21.75, 4 mos.; South Pittsburgh, No. 2, $21.50.

Scotch Pig.—The consumption of Scotch Pig is confined to a small circle in this market, and therefore the demand is very weak and prices nominal. We quote Glengarnock at $27, and Summerlee at $28, for carload lots.

Steel.—The market for Merchant Steel is rather quiet and unsatisfactory. Orders are light, and prices on low grades are freely cut in order to make any kind of a sale. Competition is strong, and manufacturers are endeavoring to force the market.

Steel Rails.—There is not much doing in Steel Rails. Most of the large consumers have placed their orders for all that they will require before the close of the year. Orders for Chicago delivery are nominally quoted at $40 ₽ ton.

Bar Iron.—The demand for Bar Iron is reported somewhat stronger than it was last week. There is no change in prices from store, and we continue to quote Refined Iron at $2.10 @ $2.20, with a possibility of 10¢ off for large lots. Mill men are more active than they have been for several weeks in soliciting trade and holding out greater inducements.

Structural Iron.—Builders' Iron continues to be in good request. Prices remain firm, as follows: Angle, $2.90; Beams, $3.60, and Channels, $3.80, with concessions as low as $3.60 on desirable lots.

Old Car Wheels.—There has been considerable demand for Old Car-wheels during the last few weeks. Purchase price, $18.50, f.o.b. at Chicago. They are reported scarce.

Scrap Iron.—There is no change to report in this market. Dealers are doing something all the time in a quiet way, but trade is considered dull. We quote, as dealers' purchasing prices for No. 1 Wrought Scrap, ₽ net ton, $17; No. 1 Cast Scrap, ₽ ton, $15; No. 1 Stove Plate Scrap, ₽ ton, $10; Machine Shop Wrought Turnings, ₽ ton, $9; Cast Iron Borings, $7; Old Plows and Plow Steel, $10; Malleable Scrap, $5.

EVERETT & POST, 156 Lake street, Chicago, report to us as follows, under date of September 15, 1883: *Pig Lead.*—This market during the past week has ruled very quiet at $4.10 for Common and Refined. There is a growing inquiry noticeable, principally from the trade west of Pittsburgh. Sales during the week amounted to some 700 tons. *Coke.*—There is nothing new to report in Connellsville Coke; prices remain very firm under a growing inquiry. Foundry Coke, $5.15 @ $5.20, and Crushed, $6 @ $6.15 for present delivery.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts., CHATTANOOGA, Sept. 17, 1883.

Business goes on quietly in the South. There are no failures of any consequence, and nobody is making big money. Stocks of heavy materials are being lowered by the piecemeal trade prevalent in this as well as in all other sections of the country. Nothing appears to be lively or on a large scale except the building trades, and that line not only flourishes, but increases steadily and rapidly. The weather is warm in the middle of the day, even hot, and dry, with very cool nights. Streams are low; boating at a standstill.

Pig Iron.—The market, though more prosperous as to the quantity, shows no sign of justifying an advance in prices. Low grades are dull and unsought. Transactions for better brands are usually at quotations, while the figures are generally shaded in the lower. We quote No. 1 Foundry, $19 @ $20; No. 2 Foundry, $18 @ $19; Gray Forge, $16 @ $19; White and Mottled, $14 @ $15; Carwheel Metal, $24 @ $26.

Ores.—We quote 50 % Brown Hematite, ₽ ton, $2 @ $2.75; Red Fossil, $2 @ $2.25, delivered at furnace.

Miscellaneous Articles.—Old Rails are scarce and higher. We quote them at $24, and strong. Consumers overreached themselves by running prices down so low that railway managers stopped sending them to the market, and thus, by sheer scarcity, they have forced up quotations. We quote Wrought Scrap, $18 @ $22; Cast Scrap, $11 @ $14; Old Wheels, nominal, $22.

Nails—Are steady at $3 rates. Mills are on double turn and find difficulty in meeting the demand. We quote at $3 rates, 60 days, large bills, 2 % off for cash; job lots, 15¢ higher.

Manufactured Iron.—The market for Bar is fairly steady. Mill men regard the business as being in a fairly healthy state. We quote carload bills at $2 @ $2.10; Track Supplies are in good demand. Railroad Spikes, $2.60; Track Bolts, $3.20; Fish Plate, $2.

Coal.—We quote Fancy Lump, $3; Common, $2.50; run of mine to manufacturers, $1.75 at mills.

Coke.—We quote Furnace Coke, $3 at point of consumption; Foundry, 10¢ @ 12¢ ₽ bushel.

LOUISVILLE.

GEO. H. HULL & Co., Commission Merchants, report as follows, under date of Sept. 15, 1883: The market is quiet. Consumers are buying generally only what they need for 30 days ahead. We quote for cash, in round lots, as below:

FOUNDRY IRONS.

No. 1 Hanging Rock Charcoal	$25.00 @ 25.50
No. 1 Southern Charcoal	22.50 @ 23.00
No. 1 Hanging Rock Stonecoal and Coke	20.50 @ 22.50
No. 1 Southern Stonecoal and Coke	20.00 @ 20.50
No. 2 " " "	18.50 @ 19.00
" American Scotch "	19.00 @ 21.00
Open Silver-gray	18.00 @ 19.00
Close "	17.00 @ 18.00

MILL IRONS.

No. 1 Charcoal	..... @ .....
No. 1 Stonecoal and Coke, Neutral	17.50 @ 18.00
No. 2 " " "	16.50 @ 17.00
No. 1 " " Cold-short	17.00 @ 17.50
No. 2 " " "	16.50 @ 17.00
White and Mottled, Cold-short and Neutral	15.00 @ 15.50

CAR WHEEL IRONS.

Hanging Rock, Cold-blast	30.00 @ 32.00
" Warm-blast	23.00 @ 24.00
Alabama and Georgia, Warm and Cold-blast	27.00 @ 28.00
Central Kentucky, Cold-blast	26.50 @ 27.00

W. B. BELKNAP & Co., Iron and Steel Merchants, Nos. 115 to 121 West Main street, report to us as follows, under date of September 17, 1883: *Bars* fail to improve as they should do at this season of the year. It was expected with the increased trade of September that we should see better prices, but many articles—almost all that are not held up by combination—are lower now than ever. There is a wide discrepancy in the views of the mills as to what prices should be. Meanwhile, demand is good and the signs of large consumption are evident everywhere. Bands and Hoops especially are neglected. *Sheet.*—There is more movement in the lighter gauges as cold weather approaches. Price still low. The immense quantity made early in the season still weighs upon the market and makes it weak. *Nails* are moving freely on orders for immediate delivery. Stocks are reduced to skeleton proportions. There has been a slight cutting since the mills last started up; nothing more than might be expected and not enough to satisfy the mass of buyers that bottom—wherever that illusive plane may be—has been reached. *Wire* is weak. There has been a decided break in Barb Wire and the prices put out by licensed factories must be a surprise to themselves. The glory of the patent seems sunk in a sea of competition. General trade is good, but everywhere the drought is seriously complained of. Large streams are shrunk to mere threads and all the springs are drying up.

CINCINNATI.

SEPTEMBER 17, 1883.—*Pig Iron.*—Market very quiet; orders confined to the immediate requirements for consumption. It is reported that the demand in the past week has been largely for the Hanging Rock Softeners to mix with lower-priced Southern kinds. Sales are principally confined to Foundry grades; Forge and Car-wheel kinds must wait till needed. Sales reported:

Best Hanging Rock Charcoal Foundry	$24.50 @ .....
Good No. 1 Hanging Rock Charcoal Foundry	24.00 @ ..
Good No. 1 Southern Charcoal Foundry	21.00 @ 21.50
Good No. 1 Southern Coke Foundry	19.00 @ 19.50
Best No. 1 Hanging Rock Coke Foundry	22.00 @ 22.50
Good No. 1 Hanging Rock Coke Foundry	20.00 @ 21.00
American-Scotch, best	21.00 @ 21.50
" good	20.50 @ .....
No. 1 Silver-gray Softeners and Fluxers	21.00 @ . ...
No. 2 Silver-gray Softeners and Fluxers	20.00 @ . ..
No. 3 Silver-gray Softeners	19.00 @ .....

No sales of Forge or Car-wheel Irons or Scrap to enable quotations. The above quotations are for deliveries to cars here, 4 mos.; the same Irons, it is said, may be put on cars at furnaces at a reduction of from $1 to $3.50 less, depending on the location.

ST. LOUIS.

HOFFER & Co., Pig Iron and Iron Ore Merchants, 214 Pine street, report to us as follows, under date of Sept. 15, 1883: The prices and conditions of the market remain about the same. Quotations are:

HOT BLAST CHARCOAL IRONS.

Missouri	$20.00 @ 20.50
Southern	20.00 @ 21.00
Ohio	25.00 @ 26.00

COAL AND COKE IRONS.

Missouri	20.00 @ 20.50
Southern	18.50 @ 20.00
Ohio	20.50 @ 25.00

MILL IRONS.

Red Short	18.50 @ 20.00
Neutral	17.00 @ 18.00

CAR WHEEL AND MALLEABLE IRONS.

Missouri	21.00 @ 22.00
Southern	25.00 @ 28.00
Ohio	25.00 @ 32.00

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Sept. 17, 1883: We have to report a fair and satisfactory trade for the past week. Values remain quotably unchanged, as per annexed figures:

Ref. Bar Iron, 1 to 6 x ½ to 1	₽ lb	2 1-10 @	2 2-10¢
" " 1 to 4½ x 1½ to 1	₽ lb	2 1-10 @	2 2-10¢
" " ¼ to 2, Round and Square	₽ lb	2 1-10 @	2 2-10¢
Hoop Iron, 1½ wide and upward	"	3 @	3 1-10¢
Band Iron, from 1½ to 6 in. wide	"	2½ @	2 6-10¢
Horse-shoe Iron	"	3 2-10 @	3 3-10¢
Norway Nail Rods	"	5¾ @	5½¢
Black Diamond Cast Steel	"	11 @	12 ¢
Machinery Steel	"	4½ @	5 ¢
Spring Steel	"	4 @	4½¢
Common Horse Nails	"	10 @	11 ¢
Railroad Spikes, 5½ x 9-16	"	2 6-10 @	2 7-10¢
Perkins' Horse Shoes, ₽ keg of 100 lb		$4	37½
" Mule Shoes		5	37½

R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, No. 21 South Frederick street, write as follows, under date of Sept. 17, 1883: We have no change to report in the Iron market. A good deal of Iron is being sold in small lots, but in a general way the market is dull, purchases being for immediate use only. We quote present prices about as follows:

Baltimore Charcoal Wheel Iron (all Baltimore Ore)	$28.00 @ 30.00
Virginia C. B. Wheel Iron	28.00 @ 30.00
Anthracite, No. 1	22.00 @ 24.00
" No. 2	20.00 @ 22.00
" No. 3	17.00 @ 19.00
" Mottled and White	15.00 @ 16.00
Charcoal C. B. Blooms	50.00 @ 55.00
Refined Blooms	40.00 @ 45.00

RICHMOND.

ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows, under date of Sept. 18, 1883: Prices are a shade easier than at last report. The surplus production of Virginia furnaces is finding to some extent an outlet on the Northern and Western markets. Quotations are as follows:

No. 1 Scotch Pig Iron	$23.50 @ 26.00
No. 1 Anthracite Pig Iron	22.00 @ 25.00
No. 2 " "	20.00 @ 23.00
No. 3 " "	19.00 @ 22.00
No. 1 Virginia Coke Pig Iron	20.00 @ 22.00
No. 2 " "	18.00 @ 19.50
No. 1 " Mill Pig Iron	16.50 @ 18.50
Virginia C. B. Charcoal	32.00 @ 35.00
Old Rails	24.00 @ 25.00
Wrought Scrap, No. 1	18.50 @ 20.00
Cast Scrap, No. 1	17.00 @ 18.00
Richmond Refined Bar Iron (per ₽)	2 2.1¢
Horse Shoes (Tredegar) per keg	4.00 @ ..
Mule " " "	5.00 @

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From Our Regular Correspondent.)

LONDON, September 3, 1883.

THE SITUATION

is, to all intents and purposes, just the same as a week ago. In almost all branches of trade and commerce quietude prevails, and there are loud complaints of the lack of new orders. Much of this stagnation is no doubt justly attributable to the holidays, but even after making due allowance for the absence from active business of a large percentage of the population of the chief cities and towns, the dullness is said to be almost unprecedented. The termination of the Parliamentary session has naturally set free a further large number of persons of good social position, and their departure hence for all parts of the world has tended to emphasize the want of purchasing among the shop keepers of the West End of London. In the provinces great hopes are being built upon the comparatively favorable nature of the harvest, but up to the present no movement of special note appears to have been inaugurated among those who may be presumed to benefit most largely by the in-gathering of the crops. At the same time there is no doubt that the farmers are having a fairly good time, and they cannot very well absorb money, or receive it for their products without keeping most of it in circulation, and so giving a certain stimulus to the retail and general industries of which they are the prime supporters in the purely rural districts. What is most remarkable in the existing situation is the almost entire absence of speculative operations. The Stock Exchange settlement just brought to a termination has been one of the lightest ever known, owing to the lack of speculation, and there is abundant evidence of the same sort of thing in iron, metals, grain, and, in fact, every department of the commercial world. It is not by any means easy to offer an adequate explanation of this remarkable circumstance, but it would appear to be probable that the current low values of all commodities may be a prime cause. The public will not speculate when values are so extremely low, while all experiences serve to prove that they will almost invariably "come with a rush" on a rising market. At present, therefore, it may be considered that there is little or no inducement for speculators pure and simple, seeing that prices are at a lower average than for many years past. It is, perhaps, worthy of careful inquiry and study as to why prices should be so universally minimized. I do not profess to have the requisite time or ability to elucidate this matter properly, but I am of opinion that a thorough and searching investigation would demonstrate the fact that a principal cause would be found to consist in the appreciation of the value of gold. To the ordinary mind this phrase may convey no meaning whatever, but to the political economist it will afford a suggestion which may be worked out to curious and instructive results. For some years past the purchasing power of gold all over the world has been slowly but surely increasing, so that a sovereign in England, a napoleon in France, a 20-mark piece in Germany, &c., will each buy more than they would five or six years ago. This result is the outcome of many and complex influences, prominent among them being the decreased production of the gold mines of the world. Here and there more gold is being raised, but there is no recent parallel to the great Australian and Californian discoveries. As a natural consequence, the gold already coined and in circulation has grown more valuable in reality, although all the nominal standards by which that value is ordinarily tested and regulated have remained perfectly immobile. Concurrently, the means of manufacturing production have been enlarged and the progress of scientific discovery, as well as the perfecting of mechanical appliances, have been so uninterrupted that we have in reality arrived at a standard of comparison which differs very widely from that of any former period. Taking all these points into consideration, and giving each its due weight, it is plain that it is futile to compare the values of to-day with those of a few years ago. Scotch pig iron at 55/ five, six or seven years ago, as the case might be, was not really any cheaper than it is to-day at 47/ or 48/, chiefly because the same money will buy a larger quantity now than then, and for the other reasons just touched upon. Whether this reduction of the standard of values is or is not destined to remain permanent yet remains to be seen. Hitherto the revolution has worked out its own ends and incidence without attracting other than casual notice. The time has now come, however, when it deserves greater attention. Perhaps *The Iron Age* will look at the subject from an American standpoint.

THE IRON MARKET

has remained very quiet in almost all departments, and is so still at the time of this writing. The holiday season is beginning to show symptoms of having exhausted itself, however, so that it is not impossible that a firmer tone may manifest itself before long. Generally speaking, the harvest over a large area of the country has been secured in capital condition prior to the hurricane of yesterday, which seems to have swept over the whole of Western Europe, and has done great damage to the fruit trees, hops, vines, &c. Such a gale at this season of the year is rare, fortunately, and it is still more fortunate that the splendid weather of the preceding three or four weeks had enabled the crops to be cut and carried. There is a wide area of country in which the harvest is only in its initial stages, so that it is hoped that the present atmospheric disturbance may prove but temporary, and that a further spell of fine weather may follow. But for this drawback the outlook in iron was not without alleviating features. One point is especially important and should be carefully noted by such of your readers as are interested in trade movements in this country. I allude to the gradually increasing firmness of coal. In Scotland, South Yorkshire, Derbyshire, &c., the coal owners are advancing their prices by 6d. and 1/ ₱ ton, and it is believed that the example thus set will have a wide following almost immediately. This change is one of the utmost significance, seeing that the cheapness of fuel has been the only means of producing low-priced iron. Any rise in coal must necessarily be followed by dearer coke, and iron cannot possibly remain unaffected for any length of time in the face of dearer fuel. The colliery proprietors allege that they are quite justified in making the alterations in their quotations, and there is much evidence in support of the statement that they are fully employed. It is pointed out that during the past few years an enormous number of coal mines have been closed or abandoned (in Yorkshire alone 130 have been so lost sight of within eight years), owing to the unremunerative prices realized, until at length the process of forcing the weakest to the wall has ended in pretty nearly, or quite, balancing demand and supply. Scarcely any new collieries, other than those owned by ironmasters, have been started for four or five years past, so that I am disposed to consider the claims of the colliery proprietors rest on a good foundation. I do not lose sight of the circumstance that the customary winter buying for the London, &c., markets sets in about this date, but that is a normal condition, and one that must be taken into account in any calculation of this character. When I have reminded your readers that the great "boom" of 1871–73 began with the coal trade under conditions very similar to those now obtaining, I shall have said all that needs to be penned by me at present.

At Glasgow warrants have been lifeless, with a range of from 46/11 to 47/1 only, which cannot be said to leave much margin for the operations of speculators. As a matter of fact, there is no speculation just now in warrants. Scotch makers' brands are mainly unchanged, as per your cabled prices of date. At Middlesboro' quotations for No. 3 are 38/6 for near futures, and 39/ @ 39/3 prompt. There is a large local business, and the shipments last month amounted to 86,000 tons, a rather larger total than had been anticipated. The ironmasters' returns had not reached me at the time of posting this letter. On the West Coast mixed parcels are about as of late. The make has been considerably lowered during the past few months, but stocks are large, and the total output is yet beyond consumptive requirements. During the past 10 days there have been inquiries for parcels of hematite pigs for shipment to Philadelphia, &c., which have inspired hopes of a revival in the American demand. Of heavy manufactured iron very little can be added to recent remarks, the output being good, but new orders relatively scarce. Nor have there been any changes of note in merchant iron, such as bars, sheets, hoops, &c. Staffordshire marked bars are £7. 10/ ₱ ton, as heretofore, with £5. 5/ for ordinary Welsh, and medium sorts between those extremes. Sheets are selling most freely, and there is said to be some call from the States for hoops. In iron rails there is no change. Old rails have been in good demand for Italy, whence large orders have come here for D. H., flange and bridge sections. For D. H. the current quotations are 66/ @ 67/ ₱ ton, f.o.b. London. There is also a better inquiry for heavy wrought scrap iron, with sales and shipments per steamer to New York at equal to 64/, c.i.f. that port. Cast scrap is dull at 36/ and upward per ton. Blooms and old railway leaf-spring steel are without inquiry. In crop ends nothing is being done on export account. In steel there is no special movement, the export business of the Sheffield crucible-steel firms being only tolerable. The Bessemer concerns are fairly busy and they are throwing enlarged quantities of ingots, billets, &c., into the market, owing to the growing dullness of their rail mills. Steel rails are quite nominal and stagnant. In some quarters the quotations are placed at £4. 15/ @ £5 ₱ ton for ordinary American sections, while in others £4. 10/ is stated to be a minimum, which is capable of being shaded. Very few new orders are in this market. In tin plates the situation is very quiet and there are contradictory reports as to prices and prospects. Some of the larger manufacturers appear to be pretty well engaged, while the smaller houses are playing into the hands of the "private brands" men and merchants in general by overproduction, poor quality and cutting prices. For B. V. grade of coke tins 16/ @ 16/3 at Liverpool, and 14/9 @ 15/ wasters, are about selling rates. For reputable brands there is a well-sustained demand from the States.

SCOTCH PIG IRON

has been very quiet since I last reported to you, the movement in warrants having amounted literally to nothing at all, as is evidenced by the circumstance that warrants have not fluctuated more than from 1d. to 2d. ₱ ton during the entire period The production has been augmented by the restarting of a furnace at Calder, making the total now at work 115, against 109 this date last year. During the past few weeks there has been a notable increase in the shipments, thus improving the comparative statistical position, as well as preventing an augmentation of the stocks. The week before last 1350 tons of pig iron were shipped to the United States and 3223 tons to Canada, while last week the quantities to these destinations were 1439 tons and 3267 tons respectively. Connal's stocks increased by 249 tons last week, and now stand at 585,345 tons, against 629,825 tons a year ago. Shipments to date are 7564 tons ahead of those of 1882 to the same date, while Middlesboro' imports into Scotland have increased by 26,719 tons. Writing from Glasgow on September 1, James Watson & Co. said: "There is no change to report in the Scotch iron market, prices remaining comparatively steady and only a limited business has been done; at the same time shipments and inland deliveries continue on a fair scale. The warrant market on Monday last was idle, transactions taking place between 46/11½ and 46/10½, cash. On Tuesday it was dull, with a small business done between 46/10 and 46/11 ₱ ton. On Wednesday the market was a shade firmer, with business from 46/10½ to 47/0½ ₱ ton. Yesterday business was transacted between 47/1 and 46/11½, cash, and to-day a fair business was done between 46/11 and 47/0½ ₱ ton, closing with buyers at 46/11½, sellers asking 47/ ₱ ton. The shipments last week were 17,009 tons, as compared with 13,151 tons for the corresponding week of last year." We quote:

	No. 1.	No. 3.
G. M. B, at Glasgow	48/	46/
Clyde, "	50/	48/
Coltness, "	59/6	52/6
Langloan, "	59/6	52/6
Gartsherrie, "	56/6	52/6
Summerlee, "	57/6	51/
Calder, "	57/6	50/6
Carnbroe, "	55/	49/
Glengarnock, at Ardrossan	55/	47/6
Eglinton, "	48/6	45/6
Dalmellington, "	49/	48/
Shotts, at Leith	59/	55/
Kinneil, at Bo'ness	49/	47/6
Carron, at Grangemouth	49/	47/6

MIDDLESBORO' PIG IRON

is as uneven as described last week, the bears having got hold of the market as regards futures to such an extent that they have forced prices down to an extent almost wholly unknown of late years. For prompt iron quotations have become a little easier at 39/, or thereabouts, in second hands, although the producers ask 39/3 @ 39/6 ₱ ton. For future deliveries 38/6 @ 38/9 is demanded, and even at those low limits buyers seem chary of entering into long-dated engagements. For G.M.B., f.o.b. at makers' wharves in the Tees, net cash, less 2½ % discount, current figures are:

No. 1 Foundry	43/	Mottled	37/6
" 2 "	41/	White	37/
" 3 "	39/	Refined Metal	55/
" 4 "	38/6	Kentledge	40/
" 4 Forge	38/	Cinder	34/

The local industries are all busy. Some anxiety is being expressed as to the effect of the salt borings upon the surface of the district, and an inquiry is now being conducted with relation to the subject.

HEMATITE PIG IRON

is still without any very special features, save that inquiries are said to have been received for parcels c.i.f. Philadelphia, which is taken to be an indication that your consumers are again likely to buy from this side. No actual sales, however, have as yet come to my knowledge. Mixed parcels, in usual proportions, are 49/ @ 49/6 ₱ ton, and West Coast makers' brands:

	No. 1.	No. 2.	No. 3.
Cleator	54/6	53/6	53/
Lonsdale	50/6	50/	49/6
Workington	50/6	50/	49/6
Lowther	50/6	52/	49/6
Distington	50/6	50/	49/6
Harrington	51/	50/6	50/
Solway	50/6	50/	49/6
Maryport	50/6	50/	49/6

North of England hematites, f.o.b. Cumberland ports, are as under:

No. or quality.	Ordinary.	Bessemer.
No. 1	51/ @	51/
No 2	50/ @	50/6
No. 3	49/ @	50/
No. 4, Foundry	@	50/
Mottled	@	49/6
White	@	49/6

FREIGHTS

are decidedly irregular, ease in some quarters being counterbalanced by greater firmness in other directions. Generally speaking, however, there is an impression that there is too much steam tonnage afloat, and that, consequently, shipbuilding is likely to experience an early and marked falling off. Outward rates from the Welsh ports are inclined to be rather firmer. For Baltimore 9/ is offered, at which figure rails and tin plates are being loaded at Newport (Monmouthshire). From Swansea 11/6 has been paid by sailing vessels for tin plates. Shipments to the Southern United States ports are on a very limited scale. For Montreal steamers are offering at 9/ @ 10/. For pig iron by ordinary steamers from Glasgow to New York rates are easier at 5/, while by sailers current rates are: Baltimore, offers; Montreal, 12/6; New Orleans, 15/ (East Coast, 9/); New York, 12/6; Philadelphia, 12/6 (East Coast, 10/); Portland, 13/; Providence, 12/6, and San Francisco, 20/. Steamers, Glasgow to Boston, 8/; Philadelphia, 7/6; Baltimore, 7/6, and New Orleans, 10/ ₱ ton of pig iron.

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels.)

PARIS, Sept. 3, 1883.—*Metals.*—Business is much delayed this fall, and metals are but moderately active, without change in price, except in Tin, which is higher. We quote at the close: *Copper.*—Chili Bars, 165 @ 167.50 francs ₱ 100 kg.; Ingots and Slabs, 170; Best Selected, 175, and Pure Corocoro Ore, 170. *Tin.*—Banca, 256.25; Billiton, 252 50; Straits and Australian, 251.25, and English, 247.50. *Lead*, 31 @ 32, and *Spelter*, 39.50 @ 40.25. *Iron.*—The railroad companies seem at length disposed to avail themselves of the depression in order to commence giving orders for material, and the Orleans Company make a beginning with locomotives. Dealers in this city still hesitate in ordering their winter supplies, probably because they think that a fresh decline impends, but in this they are not unlikely mistaken; some of them have even been daring enough, on the strength of this theory, to sell to arrive Merchant at 17 francs ₱ 100 kg.—this is the present spot figure—Charcoal Iron being worth 24; Sheets, 23 @ 26, and Wire Nails, No. 18, in bulk, 27. Since the beginning of this month there is an improved feeling in the Haute Marne, where Charcoal Iron sells at 19. At the North more inquiry is noticeable, but makers are evidently not inclined to sell all the way to the month of March at ruling rates. They quote Merchant, 16.50, and Beams, 17. St. Etienne is also less gloomy, there being received at present large orders for Rails and special Sheets, soon to be followed by adjudications of Railroad Material, especially Locomotives and Mounted Axles. In a month from now we expect brisk times in France in the Iron and Steel lines. *Coal* has not yet fully revived.

GERMANY.

(Borsenhalle.)

HAMBURG, September 5, 1883.—*Iron.*—Business in the Iron branch has kept about steady. In Rhenish Westphalia, especially, the amount of activity that might reasonably be expected about this time has not yet shown itself in any direction, for neither Pig nor Finished Iron can be called brisk. But there is certainly for a week past more inquiry observable, which would at least seem to indicate that real wants exist on the part of consumers. In Upper Silesia, on the other hand, circumstances are decidedly favorable. Throughout the demand for Puddling Pig has been good and on the increase, but as production has been fully up to requirements, stocks have not diminished as fast as they otherwise would have done; yet they are low enough to warrant an advance that has taken place to 58 marks ₱ ton. Good headway has been made in Upper Silesia in the output of Foundry Pig, now pushed with notable energy; but as Silesia had for some time past lost ground in the sale of this kind of Pig outside of the Province, either new markets have to be found or old ones reconquered, and this takes time. In Finished Iron Silesia is doing very well at present. There is a better demand in Eastern Germany generally for Sheets, Structural Iron and Special Iron. *Metals* have been dull. Lead is weak at 13 @ 13.25 marks ₱ 50 kg., German; Copper is quiet—Lake at 76; other descriptions, 71 @ 78; Tin lower, 103 @ 106, and Spelter, without anything doing, 15.15 @ 15.50.

BELGIUM.

(Moniteur Industriel.)

BRUSSELS, Sept. 4, 1883.—*Iron.*—Iron works are, on the whole, now well provided with commands, and the situation in Belgium is becoming more cheerful, with the exception of Structural Iron concerns in the Charleroi basin, and to some extent the rolling-stock manufacturers in this vicinity. These two branches at Charleroi complain that frequently there is still a lack of work. At Liège, on the contrary, no such drawbacks seem to exist, and makers there have got about as much work as they can conveniently attend to. At both Liège and Charleroi White Pig Iron commands 5.50 @ 6 francs ₱ 100 kg., and Merchant 12.50 @ 13 francs. All these prices are firm. *Metals* are steady. We quote Spelter 40 francs ₱ 100 kg; Lead, 34; Tin, 245 @ 246; Copper, 180, and Antimony, 101.25.

SPAIN.

(Revista Minera.)

MADRID, Sept. 1, 1883.—*Metals.*—The Government has just published the export figures for the first half-year:

	1881. Tons.	1882. Tons.	1883. Tons.
Calamine	15,345	17,651	20 762
Copper Ore	227,006	314,482	307,414
Iron Ore	1,762,752	2,055,958	2,181,197
Other Ores	38,633	32,550	50,144
Quicksilver	1,272	1,021	446
Ingot Copper	6,396	11,110	10,921
Finished Iron	16,052	23,560	27,707
Pig Lead	53,501	59,600	61,974
Total	2,120,957	2,515,932	2,660,565

The decrease in Quicksilver will be noticed.

HOLLAND.

(Koch & Vlierboom.)

ROTTERDAM, Sept. 2, 1883.—*Tin.*—The market has been quiet during the week and the dealings have been light. Banca spot may be quoted 57 guilders ₱ 50 kg.; Billiton, 56, and distant afloats of the latter, 56.75 @ 56.50. Deliveries of Banca in Holland since Jan. 1, 88,684 slabs, against 87,054 in 1882 and 104,303 in 1881; Billiton, 8974, against 5841 and 8266 in August, and since Jan. 1, 60,568, against 69,411 and 77,408; the large August deliveries of Billiton will be noticed. The price of Banca a year ago was 62, and in 1881, 54.50.

AUSTRIA.

(Austrian Trade Journal.)

VIENNA, Sept. 2, 1883.—*Iron.*—The social troubles in Hungary have unfavorably influenced trade in the provinces. This relates particularly to Pesth, the capital of that kingdom, where dealers do not feel disposed to execute orders for the interior, confidence being destroyed. These unfortunate circumstances have affected the trade in Finished Iron and Pig even in Austria proper, the former in particular. With the exception of this incident the situation is sound in Austria proper; although for the moment the fall trade has not fully set in yet, the tendency is good, and there is great steadiness in Pig Iron, Sheets, and partially in Merchant Iron. The Singer Mfg. Company, of New York, have bought quite extensively real estate at Floriadorf, near Vienna, for the purpose of erecting there a large sewing-machine factory, and have made contracts for the Pig Iron with the Alpine Company for casting the stands of machines. In Austria the manufacture of cast-iron tubes, formerly imported, is also becoming quite important all of a sudden. Great activity also prevails in Austria in the construction of railway bridges.

CHILI.

(Weber & Co.)

VALPARAISO, July 23, 1883.—*Copper.*—Bars have given way to $17.05; at this figure there is an improved demand, leading to sales during the fortnight of altogether 33,000 quintals. The price named, with 45/ freight per steamer and 35⅝d. exchange, is equal to £63. 12/6 ₱ ton. *Nitrate* has been quiet during this week and the previous one, but a few lots were taken to fill vessels loading, and for this reason the price asked, $2.35, had to be paid for 95 %, and $2.40 for 96 %. As this is considerably above European parity, there is likely to be a decline as soon as more is offered. Sales, 23,000 quintals; $2.35 at 48/ and 35⅝d. exchange is equal to 10/4 ₱ cwt. During the week 18,408 tons chartering took place. *Coal* firm at 32/6 Newcastle and West Hartley. *Exchange*, 90 days, London, 35⅝d.

AUSTRALIA.

(Per Cable via London.)

SYDNEY, Aug. 30, 1883.—*Iron.*—The market, both for Pig and Finished, has been irregular during the fortnight, and little has been done. This state of affairs is, however, likely soon to make room for greater activity. Galvanized No. 26 is worth £21. 12/6, which is an advance of 5/ since Aug. 5. Fence Wire is for the moment neglected and quotable without change, £12. 12/6.

EAST INDIES.

(Schmidt, Kustermann & Co.)

PENANG, July 28, 1883.—*Tin.*—The market opened at $29.60 ₱ picul, and after some slight fluctuations rose to $29.87½, under a good European demand, but after a while returned to $29.60, at which it closes weak. Out of the 9500 piculs arrived, Europeans took 3700 and Chinese 5000. *Exchange*, 3/8.

(Hessenauer & Co.)

COLOMBO, Aug. 4, 1883.—*Plumbago.*—At ensuing rates a small business has been transacted; we quote, in rupees, ₱ cwt.: Lump, Fine, 140 @ 150; Ordinary, 125 @ 130; Chips, 60 @ 70; and Dust, 40 @ 50. Shipments from October to date, 92,916 cwts. to England; 205 to Treste; 755 to Havre; 3016 to India, and 117,703 to the United States; together, 214,595, against 190,472 in 1882; 150,390 in 1881, and 102,054 in 1880. *Exchange*, 6 months' sight credit bills on London, 1/8 1-32.

The following compilation gives the exports of iron and steel from Great Britain for seven months ending July 31, during each of the last 12 years:

Years.	Pig iron, tons.	Rails, tons.	Manufactured iron and steel, tons.	Totals, tons.
1872	810,468	532,605	648,197	1,991,270
1873	723,606	425,550	640,421	1,799,577
1874	382,665	505,164	501,886	1,389,715
1875	530,223	330,908	554,134	1,415,265
1876	497,583	221,327	512,680	1,231,590
1877	497,073	280,855	562,828	1,340,756
1878	505 813	281,906	537,118	1,326,917
1879	620,697	251,174	502,765	1,434,830
1880	1,079,311	430,701	900,827	2,410,809
1881	798,621	474,295	811 713	2,084,629
1882	961,004	551,517	980,751	2,198,172
1884	869,143	592,819	871,841	2,333 793

There is much difference of opinion in regard to the advantages to be derived from the visit to this country of the Corean Embassy, whose presence in New York is just now among the chief sensations. A Washington dispatch intimates that the commercial results will be of the least importance, as there are few commodities which can be profitably exchanged. There are others who believe that Corea, with her 15,000,000 inhabitants, will want mining and agricultural machinery, also manufactured cottons, and, in time, will offer a market for American manufactures equal to that of Japan.

Iron as a Building Material.

The *American Architect* in a recent issue has some remarks in regard to the use of iron as a building material which are worth consideration by mechanics, machinists, and, in fact, by every one who has anything to do with construction in iron:

Of all comparatively new materials, the modern architect has to take chief account of iron. Its remarkable qualities, its power of resisting compression, its wonderful tensile strength, render it one of the most useful servants of the building constructor. Its cheapness, too, when these qualities are taken into consideration, is another powerful factor in favor of its use. On the other hand, we know that it has certain inherent defects, such as its oxidation when exposed to the action of the air, and its rapid and total loss of strength when subjected to a very high temperature. This points to its being protected, both from the action of a damp atmosphere and from the effects of fire, by some impervious coating of cement or plaster. This application of plaster to the soffit of a wrought iron beam, or as a casing to a cast or wrought-iron column, is as common sense and intelligent a use of the material employed as the coating of a stucco to a Doric column formed of coarse calcareous breccia. Only let the column from its delicacy proclaim its iron core, and there will be no false construction about it, and as much true art perception may be shown in the treatment of its plaster covering as we admire in the exquisite lines of the Doric column.

With regard to the safety of iron thus treated in the case of the severest fires, we have had already some proof. As, however, it is impossible to make any material absolutely air-proof, it is as well always to give excess of thickness to all parts of an iron structure, even to those not subjected to any strain, so as to allow for a reasonable amount of oxidation, as, for instance, to the web of a beam (its neutral axi-), being neither subjected to the compression experienced by its upper flange, nor the tension experienced by its lower. When the formula for the construction of wrought-iron beams was first discovered, beams were made of a web of almost gossamer thickness. Such beams, I have heard an engineer remark, should be kept in vacuum at a uniform temperature of 60° F., and then they would doubtless continue to perform their functions for an indefinite time; but such not being the conditions in which they find themselves, they must sooner or later yield to circumstances. It behooves us, therefore, in the employment of iron, to take account of atmospheric deterioration, and also to be aware of the two great facilities it gives of superimposing great weights over voids, as of walls many stories in hight dividing a number of small apartments above one large one. Such is not desirable construction, though it may have sometimes to be resorted to, and is one of the evils begotten of competition, when, in order to fulfill the instructions to the letter, many expedients have been resorted to, which a skillful constructor, if unshackled by such conditions, would know how to avoid. Moreover, however carefully you may case your iron, so as to cause it to retain much of its power during a fire, you can hardly so isolate it from heat as to prevent its serious expansion and the consequent disturbance of the stability of your walls.

New Chinese Cotton Mill.—The establishment of a cotton mill at Shanghai, China, is a new departure for the natives of the Celestial Empire, yet the undertaking has become an established fact and several manufacturers and dealers in mill machinery, supplies, &c., of this country, have been awarded contracts for the furnishing of a large part of the plant. The mill, which will be run by Chinese capital, under the direction of Mr. A. W. Danforth, formerly engaged in the manufacture of cotton goods at Newburyport, Mass., will have about 400 looms and 20,000 spindles. The mill machinery in every department will be made up of one-half American and one-half English. The Providence Machine Company have the contract to furnish all the roving frames and slubbers, fine and intermediate, while the Messrs. Brown Bros. & Co. have been awarded the contract for furnishing the entire mill supplies, including belting, bobbins, the roving cans, shuttlers, harnesses, reeds, card grinders, oils, &c., and a part of which they have just shipped with the engine from the Corliss works. Another Providence concern—the Providence Steam and Gas Pipe Company—have also an extensive contract to furnish all the steam pipe, hydrants, automatic sprinklers, &c., throughout the mill.

The latest Sheffield (England) papers remark that "ironmasters are passing through a very trying time, working, we fear, in many cases without profit, if not at an absolute loss, and yet it is pretty generally felt that any attempt to run up rates just now would so seriously check business as to be a loss rather than a gain." Dullness in the cutlery and steel trades is ascribed mainly to the slack American demand. Some of the largest houses have accumulated heavy stocks.

New York City is now in direct communication with Rio de Janeiro by telegraph, so that dispatches are now received in our Coffee Exchange only two hours after they are written. From Rio the new line has been extended by way of Montevideo and Valparaiso on land wires through South and Central America, crossing the Isthmus of Tehuantepec, and going thence by cable to Galveston, Texas. With improved facilities our trade with South America ought soon to be materially extended.

It has been frequently asserted that although Poland contains some of the richest and most productive Provinces of the Russian Empire, the Government would not allow Polish subjects to develop their natural riches, lest the acquisition of wealth should furnish the means for revolution. The truth of the statement cannot be vouched for, but there have been and are still restrictions which account in a great measure for the absence of the development of Poland's mining and metallurgical industries.

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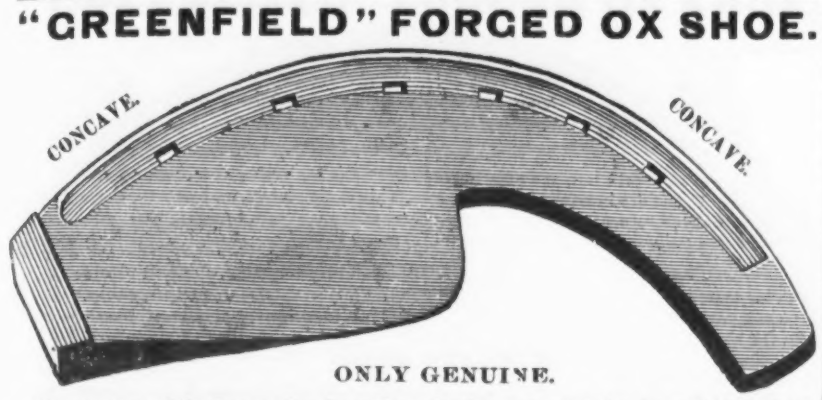

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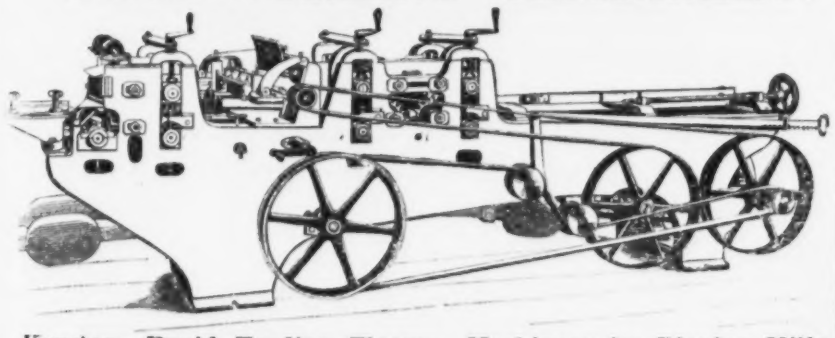

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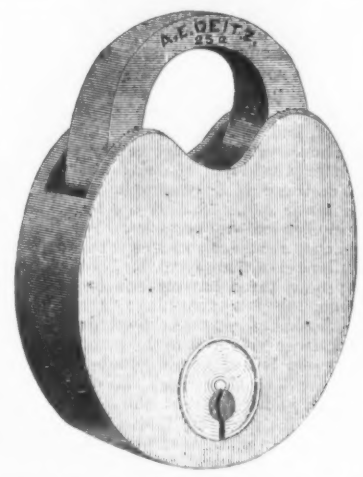

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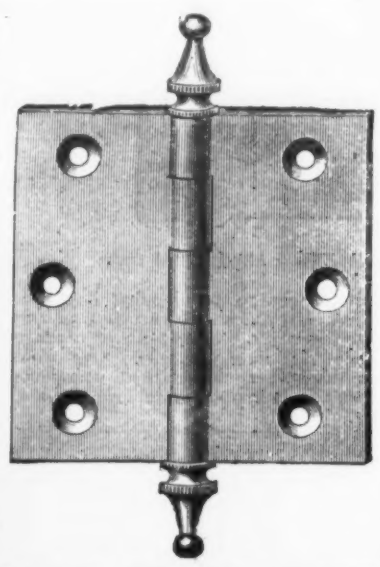

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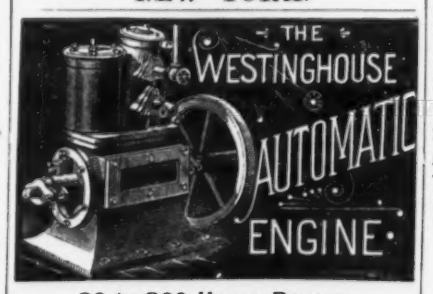

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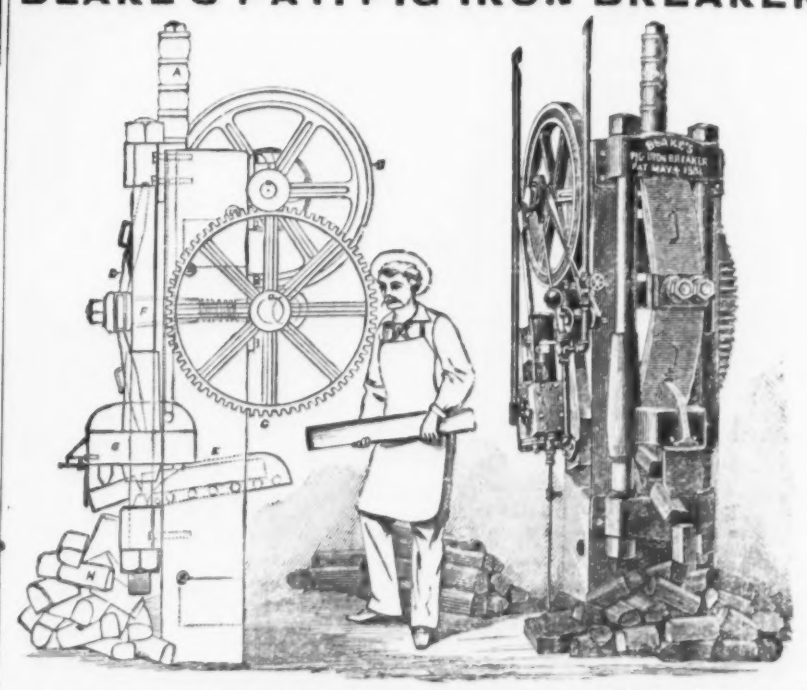

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The Westminster Ship Canal.

According to the London *Ironmonger*, the promoters of the proposed ship canal from the River Mersey to the outskirts of Manchester do not appear to be disheartened by their defeat in the committee rooms of the House of Lords, but have promptly "pulled themselves together," and are already preparing to go into the fight afresh next session. Instead of being discouraged, indeed, they express the utmost confidence in the ultimate success of their scheme, and regard the decision given against them as being a powerful incentive to renewed exertions. They feel that the cause they have in hand is of such vital importance to a large area of the country that they are resolved to push it forward at all hazards, and totally irrespective of pecuniary cost. Such enthusiasm and perseverance are worthy of any cause, and cannot fail to enlist sympathy and support, not only in Lancashire, but in all quarters where the true importance of extended canalization is properly realized. Whether the proposed ship canal would or would not prove a practical success may be a matter open to debate, but that its construction offers no insurmountable engineering difficulties has already been amply demonstrated. To Manchester and the many large towns contiguous to the capital of the cotton trade, such a canal would unquestionably be of the highest possible value, while to certain parts of Yorkshire and Cheshire it would also prove a great convenience. That the promoters have every confidence in their scheme, and that the public is with them, seems to be proved by the large amount of pecuniary support accorded to the project, even in its present incipient condition. At a meeting of the subscribers to the Parlimentary Fund, held a short time ago, it was shown that over $233,500 had been received in cash, and $235,000 spent, the latter sum affording some idea of the cost of promoting an undertaking such as this in the teeth of the truly formidable opposition arrayed against it.

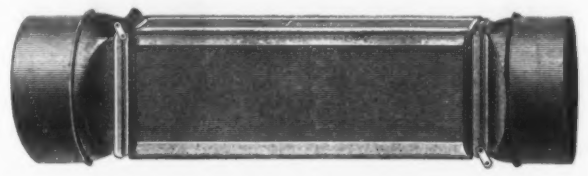
The bill has already encountered, and will again have to face, the combined opposition of all the railway companies running into Liverpool, as well as of the authorities and vested interests of the great port on the Mersey, but it is thought that if the promoters of the canal can show the real necessity that exists and calls for its construction, they will triumph over all their opponents, and the Manchester Ship Canal will in due course be an accomplished fact.

The Chinese Foot Rule.—A writer in the *North China Herald* gives some curious information respecting the foot measure in China. At present it varies largely in different parts of the country, and according to different trades; thus the foot of the carpenter's rule at Ningpo is less than 10, while that of the junk builders at Shanghai is nearly 16 inches. But a medium value of 12 inches is not uncommon. The standard foot of the Imperial Board of Works at Peking is 12½ inches. A copper foot measure, dated A.D. 81 is still preserved, and is 9½ inches in length. The width is 1 inch. The small copper coins, commonly called *cash*, were made of such a size, sometimes, as just to cover an inch on the foot rule. In the course of two centuries it was found that the foot had increased half an inch, and a difference in the dimensions of musical instruments resulted. Want of harmony was the consequence, and accordingly in A.D. 247 a new measure, exactly 9 inches in length, was made the standard. Among the means employed for comparing the old and new foot are mentioned the gnomon of official sun-dials, and the length of certain jade tubes used according to old regulations as standards. One of these latter was so adjusted that an inch in breadth was equal to the breadth of 10 millet seeds. A hundred millet seeds or 10 inches was the foot. The Chinese foot is really based on the human hand, as is the European foot upon the foot. It strikes the Chinese as very incongruous when they hear that we measure cloth, woodwork, masonry, &c., which they regard as especially matters for the hand, by the foot. Of the jade tubes above mentioned there were 12, and these formed the basis for the measurement of liquids and solids 4000 years ago. They are mentioned in the oldest Chinese documents with the astrolabe, the cycle of 60 years, and several of the oldest constellations. It is likely that they will be found to be an importation from Babylon, and in that case the Chinese foot is based on a Babylonian measure of a span, and should be 9 inches in length.

Perhaps the most unsatisfactory things in current scientific literature are the recipes given for making various substances or for performing various operations. A recipe usually has a great fascination for one who has a little knowledge of the arts, and writers much given to the compilation of books like to produce a recipe book, and the greater the number within the covers the greater is the supposed value. Usually these are composed by men who have little practical knowledge, and a still smaller knowledge of chemistry. The result is a most horrible mingling of old and new chemistry, of directions which were obsolete 50 years ago, and of names which no chemist will now recognize. In general it is safe to say that 90 per cent. of the directions given lack that definiteness which is essential to success. Some of them are criminal. For example, not long since many of the scientific papers published directions for etching glass, and without a single word of caution, either in regard to its terribly corrosive qualities or its dangerous fumes, directed their readers to use hydrofluoric acid. Those who know enough to safely handle the acid would also know all about its properties and how to use it for glass etching, and for those who had not this knowledge or experience it would be about as dangerous as giving a pound of gunpowder to a man unacquainted with its properties and remarking that it was combustible. Not long since one of our exchanges suggested that two ounces of pure rubber in thin slices dissolved in a pound of bi-sulphide of carbon would make a good cement for rubber belting. It adds, if kept long it thickens very soon. Only imagine some one with a leather belt to mend undertaking without further directions to make a pound of cement with bi-sulphide of carbon. The attempt would probably cause him to abhor bi-sulphide to the end of his life.

Adjustable Double Elbow.

We show in the accompanying illustrations a decided novelty in the elbow line. Fig. 1 represents the device arranged as a straight piece of pipe. One peculiarity is a square section having nickel-plated corners. Above and below it terminates in round collars. These collars, however, can be slipped out from the square section, and for this purpose have what might be called a square ferrule. Their peculiarity is in having a hinge at one side which enables them to be turned so as to form an angle with the straight pipe. Fig. 2 shows the upper collar turned to the right through an angle of about 45°, and the lower collar turned in the opposite direction to a similar angle. In other words, an elbow having any angle can be made by using the hinge of which we have spoken. This is a flat-back elbow, as is shown in the cut. Fig. 3 represents an elbow making a full right angle. By removing the ferrules from the square tube they can be put in so as to be parallel with each other, or stand at right angles, or both to point in the same direction. The pair make a complete double offset elbow that is available in putting up stoves so as to enable the elbow to be used in any place where the stove-pipe hole and the collar of the stove are within the reach of the length of square pipe. The hole may be above or below, to the right or to the left, and yet the adjustable elbow will fit exactly without the necessity of using tools As will be seen by a moment's thought, it is necessary to have the back or curved surface of the elbow telescope out flat, in or under, not to obstruct the draft when the line of pipe is parallel with the square section. This is accomplished by a pair of guides in the thimble which slides into the square part, the back side by its elasticity fitting either straight or curved, and the offset or the angle, as will be understood, may be made from 1 inch to the full amount. In regard to them, the manufacturers—The Standard Pipe Company, Boston, Mass.—say that they are now making them in three sizes, 5, 5½ and 6 inches, and in length 10, 12 and 14 inches. The length is the main body or square portion of the pipe between the elbows. The 14-inch straight pipe is adjustable anywhere under the mantel within a circle of 3 feet. A rigid elbow, of course, is good only for the place for which it is made. The internal mechanism of the elbow is such as to leave the space quite unobstructed for the passage of the smoke. The present season the company are making two qualities, one of genuine Russia iron and the other of American iron, known to the trade as "Harvey." It is intended in the future to make ornamental as well as plain elbows. As a convenience both for the stove dealer and the householder, the elbow certainly promises very well. In its present form it is very neat and has rather a novel appearance. They are sold cheaper at wholesale than ordinary double elbows, and will bring a considerably higher price at retail.



Adjustable Double Elbow.—Fig. 1.—Both Elbows Straightened Out.

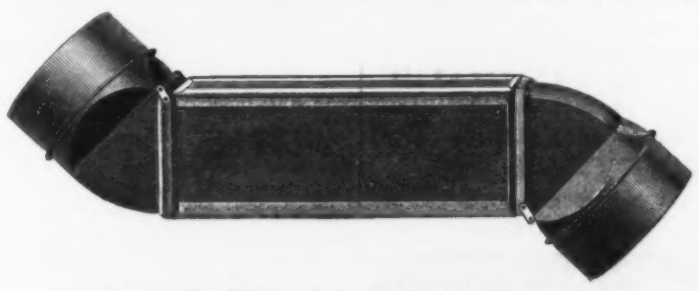


Fig. 2.—The Elbows at an Angle of 45 Degrees.

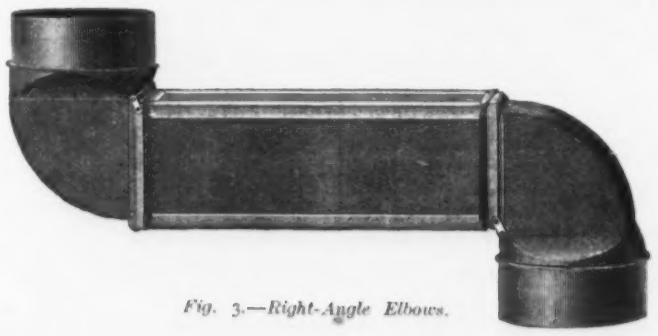


Fig. 3.—Right-Angle Elbows.

Electric Street Car in Paris.—The propulsion of street cars by electricity was tested by the French Electrical Power Company, in Paris, on the 6th inst., with satisfactory results. The vehicle used was an ordinary horse-car, and was propelled through the important thoroughfares for a distance of 30 miles. The trial lasted six hours, and, it is said, was not attended by any accident or the frightening of horses. The driver seems to have had no difficulty in bringing the car to a standstill within a second, whenever he desired. The vehicle was turned off from one set of tracks to another, across several yards of trackless ground, with admirable ease. The locomotion is effected by Faure-Sellon-Volckmar accumulators. The speed was 9⅓ miles an hour on level ground and 5½ miles on an ascent. This experiment, the first ever made over a long distance, is regarded as proving the practicability of electric cars. The estimated cost is one-half that of horse-cars. M. Ferdinand de Lesseps and several engineers and journalists witnessed the trial.

Cheap Transportation.

The demand for cheapness seems perpetual and insatiable. All the strength of human muscles, all the ingenuity of human brains, and all the power of enormous machinery are taxed to produce articles to eat, drink or wear, a little cheaper this year than they were last, and, although the effort is continuously successful, we are never satisfied. No matter what level of cheapness may be reached, there is a perpetual demand for a still lower one. This is most strikingly illustrated in railway carriage. The time is within easy recollection when it cost $1.80 to send a barrel of flour from St. Louis to New York; now three barrels can be sent for that sum. A few years ago it cost more than a bushel of corn was worth on the Mississippi River to send it to the seacoast; that is, for every bushel of this grain that was sent by rail to New York, another bushel and a half had to be sent along to pay the freight on it; now one bushel of corn will pay the freight charges on nearly three bushels. "Poor's Manual" for 1882 shows that the charge on all the railway freight moved in New England last year was 1.07 cents a mile per ton; the charge in the Middle State was 1 cent; the charge in the Southern States was 1.8 cents, and in the Western States 1.2 cents. These figures will be better understood by remembering that a ton is a two-horse load, and that $1 to $1.50 is the teamster's charge for hauling it a mile. The railroads did all the carrying, amounting to over 360,000,000 tons, at a charge of only 1.2 cents per mile. One would think this is cheap enough in all conscience, and that it is impossible to bring it down lower.

Reversed Blue Process.

A firm in New York have been recently advertising a reversed blue-process paper, or positive ferro-prussiate process, by which dark-blue lines can be obtained on a white background at the first impression. Almost every one who has had occasion to use the blue process has at first felt that a means of getting a reversed print would be very valuable, and in some of our best establishments a large amount of ingenuity has been expended in order to discover means for doing this. It has been discovered in most shops, however, that white lines on a dark ground are vastly more durable and more clearly read, in case the drawing has received careless handling, than dark lines on a white ground, and hence there is comparatively little demand for a reversed process.

As we were curious to know what the new process was like, we visited the place and tried to buy a small quantity of paper in order to try it. We were politely told that we had no facilities for trying it, that it worked perfectly, but that we should be unable to do anything with it. We replied that we were prepared to obtain any materials or any apparatus that were needed to undertake a demonstration of the convenience and working of the process, and would give it a most impartial test. Nothing, however, could induce the salesman, who was also a member of the firm, to sell anything less than a roll. The profuse explanations and apologies which accompanied this refusal led us to have some suspicions in regard to it, and, as we did not wish to buy a roll of 11 yards for the sake of using a yard or two, we dropped the matter. We succeeded in finding a sample of the prints made by this method, which shows a very fair Prussian-blue line on white ground, but the directions for use are not encouraging. First, a zinc dish is used, to contain a saturated solution of the yellow prussiate of potash. This solution is made by pouring equal weights of water over the potash in an earthen pot, and, second, there must be a wooden dish lined with hard rubber, glass or lead, or any other material not affected by one of the two solutions to be put into it. The solution for this dish is either made of 1½ ounces of hydrochloric acid and 1¼ pints of water, or 15 drams of sulphuric acid to the 1¼ pints of water. Lastly, of course, there is the usual zinc dish to wash the prints. For each of the dishes a "bristle brush" is necessary. For the first one it must be about 3 inches wide with 3-inch bristles. That for the acid must be entirely of wood, the bristles being 5 inches in width and 2 inches long. The picture, of course, as the chemist will see from examination of the directions, is produced by development, and several slips have to be put under the tracing, withdrawn from the edge from time to time and developed in order to ascertain how the printing is progressing. These are immersed in the first dish for a half-minute or so, to ascertain when the exposure has proceeded far enough. When these slips remain perfectly clear the tracing is ready for development. The sheet has to be floated on the solution of prussiate of potash, and care must be taken not to allow the solution to get upon the back.

We should be very glad to hear from those who have used the process and can tell us something in regard to its practical working as compared with the ordinary blue prints. Although hardly the thing for general shop work, yet there are many places where a positive process might prove useful. We are very sorry that we had no opportunity to try it, as it would be of value in certain lines of work that we have to pursue occasionally. In the circular that we have received, the paper is stated to be C. L. J.'s patent, from which, we judge, it is not desired to have the patent known, nor the name of the patentee.

Finance in the Dominion.

The failure of the Bank of Montreal, with nearly $3,000,000 of liabilities and total assets amounting to $3,805,207, is one of the events of the week. According to a Montreal paper, the bank's embarrassment is due to the large expansion of its business and the difficulty of realizing quickly on outstanding loans. Among the assets which must be classed as doubtful are "the current loans, discounts or advances to the public," which are put down at $2,915,106, and we shall not be surprised if it appears on examination that "the public" are conspicuously represented among the directors themselves. Previous exhibits of the condition of Canadian banks have disclosed a weakness in that direction. Taken together, the banks in the Dominion represent a large capital, put down in the August statement, just completed, at $227,200,000, and they occasionally have large sums for use in Wall street operations.

The paid-up capital of 39 banks making returns to the Government is, in round numbers, $61,000,000; notes in circulation, $32,000,000; Government deposits, $8,300,000; public deposits payable on demand, $45,000,000; deposits payable after notice, $56,000,000; due to banks in foreign countries and the United Kingdom, $1,800,000; total liabilities, $145,000,000. The assets, made up in round numbers, are as follows:

Specie	$6,500,000
Dominion notes	11,200,000
Notes of other banks	6,100,000
Balances due from other banks in Canada	3,100,000
Balances due from banks in the United States and foreign countries	13,000,000
Due from British banks	3,700,000
Advances made, for which stock is held as collateral security	11,000,000
Loans to corporations	15,000,000
Current loans to the public	142,000,000
Discounts overdue	1,700,000
Total assets, including bank premises and mortgages, amount to	$227,200,000

Of this amount, according to a special dispatch from Ottowa, the directors have loaned themselves over $8,000,000, which figures among the assets. One year ago deposits on demand and those bearing interest were nominally the same as now. There is a difference of over $10,000,000 in favor of deposits bearing interest, which indicates that demand deposits have fallen off, and that money is being withdrawn from active commercial investments and placed at low rates of interest in banking institutions. There is a reduction of nearly $1,000,000 in specie held during the past year, although the amount is still large. There has been a large shrinkage in advances made for which stocks are held as collateral. Loans to private corporations have largely increased. Of the total sum of $2,700,000 of Government deposits payable on demand, held by banks, 50 per cent. is held by the Bank of Montreal. Some of the best financiers of the Dominion have heretofore given ample warning against undue expansion in favor of speculative enterprise.

Judging from the number of exhibitors of peat fuel at the late Moscow (Russia) exhibition, it would appear that the production of this material is increasing to a considerable extent. It is, in fact, stated to be a most important industry in Russia, as wood is growing dearer every year, and in many industrial localities the woods have become entirely exhausted. The peat bogs of Russia, however, are practically inexhaustible, extending, as they do, over an area of thousands of square miles. Peat is supplied to the railways, factories and manufacturing establishments in general. One large firm of cotton spinners in the Government of Vladimir produce something like 144,000 tons per annum, which is all consumed in their own factories.

RECENT BOOKS.

Crane.—The Smithy and Forge. By W. J. E. Crane. 146 illustrations, 195 pages, 12mo, cloth; London, 1883 . . . . . $1.00

This is the latest addition to the popular and reliable Weale's series, and we believe it is the first book in the English language that treats exclusively upon the art of the blacksmith in special relation to Horse Shoeing. The remarks upon this subject show careful preparation. The anatomy of the horse's foot is described and illustrated, together with the processes of fitting and nailing, &c. Considerable space is given to descriptions of the Forge and Blacksmiths' Tools in general, and the methods of forging shoes, nails, chains, anchors and miscellaneous articles. Carriage Ironing and Spring Making are treated upon, and there are chapters upon Ornamental Ironwork and Bench Work, the whole forming a work of decided value to workers in iron, and especially to those interested in the particular subjects discussed.

Chordal's Letters for Practical Mechanics and Engineers. $2.

Crane, W. J. E.—The Sheet Metal Worker's Guide. 60 cents.

Donaldson Wm.—Ponce'et Turbine and Water Pressure Engine and Pump. $2.

Morrison, R. S.—Mining Reports; English and American Reports on the Law of Mines. $5.25.

Sternberg, G.M.—Photo-Micrographs and How to Make Them. $3.

Sherrerd, J. M.—Iron Analysis Record, with Complete Table of Atomic Weights. $1.25

Thompson, Prof. S. P.—Life of Phillip Reis, the Inventor of the Telephone. $3.

Sent postpaid, on receipt of price, by

DAVID WILLIAMS,
Publisher and Bookseller,
83 Reade St., NEW YORK.

NEW YORK WHOLESALE PRICES, September 19, 1883.

(For Wholesale Hardware Prices See Pages 31, 32.)

METALS.

IRON.—DUTY: Bars, 8-10c to 1 1-10c ₩ lb; provided that no Bar Iron shall pay a less rate of duty than 1c per cent. Sheet, 1 1-10c to 1 5-10c ₩ lb. Band, Hoop and Scroll, 1c to 1 4-10c ₩ lb. Pig and Scrap, 3-10 of 1c ₩ lb. Plate, 1¼c ₩ lb. Railroad Bars weighing more than 25 lb ₩ yard, 7-10 of 1c ₩ lb.

American Iron		
Foundry, No. 1	₩ ton	$22.00 @ 23.00
Foundry No. 2	₩ ton	19.00 @ 20.50
Gray Forge	₩ ton	18.50 @ 19.00
Scotch Iron.		
Eglinton	₩ ton	21.00
Carnbroe	₩ ton	22.50 @ 23.00
Coltness	₩ ton	25.25
Shotts	₩ ton	25.00
Glengarnock	₩ ton	22.50
Gartsherrie	₩ ton	23.00 @ 24.50
Langloan	₩ ton	23.25
Summerlee	₩ ton	22.50 @ 24.00
Dalmellington	₩ ton	20.75 @ 21.00
Rails.		
Steel, at Eastern mills	₩ ton	37.50 @ 38.00
Old Rails Ts		23.00 @ 23.50
Scrap.		
Wrought, ₩ ton from ship and yard		22.75 @ 25.00
Bar Iron from Store.		
Common iron		
⅝ to 1 in. round and square / 1 to 6 in. x¾ to 1 in.	₩ lb	2.10 @ 2.20c
Refined Iron:		
⅝ to 2 in. round and square / 1 to 6 in. x¾ to 1 in. / 1 to 6 in. x⅛ and 4-10	₩ lb	$2.30 @ 2.40c / 2.50 @ 2.60c
Rods—⅜ and 11-16 round and square	₩ lb	2.40 @ 2.50c
Bands—1 to 6x3-16 to No. 12	₩ lb	2.70 @ 2.80c
Norway Nail Rods		5 @ 5¼c

Sheet Iron.

		Common American	R. G. American.
Nos 10 to 16	₩ lb	3.15 @ 3.30c	4½c
17 to 20	₩ lb	3.40 @ 3.65c	4½c
21 to 24	₩ lb	3.65 @ 4.00c	4¾c
25 to 26	₩ lb	4.00 @ 4.25c	5 c
27	₩ lb	4.25 @ 4.50c	5 c
28	₩ lb	4.40 @ 4.65c	5¼c
	B. B.		20 qual.
Galvanized, 10 to 20	₩ lb	7 c	6 c
Galvanized, 21 to 23	₩ lb	7½c	6½c
Galvanized, 25 to 26	₩ lb	8¼c	7 c
Galvanized, 27	₩ lb	9 c	7½c
Galvanized, 28	₩ lb	9½c	8 c
Patent Planished	A ₩ lb	10½c	B. 9½c
Russia	₩ lb		14c
American Cold Rolled B. B	₩ lb		7½c

COPPER.—DUTY: Pig, Bar and Ingot, 4c; Old Copper 2c ₩ lb. Manufactured including all articles of which Copper is a component of chief value, 35 % ad valorem.

American ingot ₩ lb See Trade Report.

SHEATHING BRAZIERS COPPER, BOLTS, &c.

Braziers' Copper, ordinary sizes, 16 oz. per sq. ft., and over ₩ lb	26c
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz., ₩ sq. ft.	₩ lb 28c
Braziers' Copper, 10 oz. and 12 oz., ₩ sq. ft.	₩ lb 30c
Braziers' Copper, Lighter than 10 oz. ₩ sq. ft.	₩ lb 32c
Circles less than 8 in. in diameter	₩ lb 28c
Circles 8 in. diameter and over	₩ lb 31c
Segment and Pattern Sheets	₩ lb 26c
Locomotive Fire Box Sheets	₩ lb 26c
Sheathing Copper, over 12 oz. ₩ sq. ft.	₩ lb 24c
Bolt Copper	₩ lb 26c
Copper Bottoms	₩ lb 31 @ 26c

No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the sq. ft.

TINNING.

Sheets 14 x 48	₩ sheet 8c
All other size Sheets, 29c ₩ sq. ft.	

For tinning both sides, double the above amount.

O'NEILS PATENT PLANISHED COPPER.—Net.

14x48.

22d 16 oz. and heavier	₩ lb 37c
By the case, 16 oz. and lighter	₩ lb 36c
"	₩ lb 40c
"	₩ lb 39c

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in. 14x60.

22 and 16 oz. and heavier	₩ lb 39c
By the case,	₩ lb 38c

(And all sizes not over 20 in. wide.)

24x48&30x60.

14 and 16 oz. and heavier	₩ lb 41c
"	₩ lb 44c

SHEATHING METAL.

Yellow Sheathing metal	₩ lb 20 @ 22c

BRASS.

Brown & Sharpe's Gauge the Standard for Metals. Old English Gauge the Standard for Wire.

BRASS MANUFACTURERS' PRICE LIST.—dis. 30 %, June 10, 1880.

Cash prices for Roll and Sheet Brass. For less quantities than 100 lbs add 3c. ₩ lb.

HIGH BRASS.

All Nos. not thinner than No. 26, wider than 2 in., not wider than 14 in.	30c
All Nos. to No. 26, inclusive, and widths over 14 to 20 in., inclusive	35c
All Nos. to No. 26, inclusive, and widths over 20 to 30 in., inclusive	38c

½c. ₩ lb advance on each No. above Nos. 26 to 36, inclusive

All Brass thinner than No. 36 is Platers' Brass, at	53c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in.	37c
Printers' Rules	45c
Sheets wider than 40 in. and under 40 in.	47c
" 40 in. and over	50c
Circular Sheets, in diam. from 4 in. to 14, inclusive	40c
" over 14 " 20, "	45c
" " 20 " 30, "	49c
" " 30 " 40, "	55c
" " 40 in.	59c

LOW BRASS.

Four cents ₩ lb more than High Brass

Gilding Metal, 8c ₩ lb more than High Brass.

Platers' or Gold Metal	In Bars	48c
	Sawed	51c
	Planed or Polished	54c

FOR SLITTING.

Metal, in width 1 in. to ⅛ in. to No. 28, inclusive, 1c ₩ lb advance.	
Metal, in width 2 in. to 1 in thinner than No. 28, 2c ₩ lb advance.	
Metal, in width 1 in. to ⅛ in. thinner than No. 28, 3c ₩ lb advance	
Metal in width ⅛ in. to ¼, inclusive, not thinner than No. 28, 2c ₩ lb advance.	
Metal in width ⅛ in. to ¼ thinner than No. 28, 4c ₩ lb advance.	
Metal, ¼ in. in width and less, 10c ₩ lb advance.	

Any of the above widths cut to particular lengths, add 7c ₩ lb.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire
1 per cent., 12 inch to No. 26	$0.52	$0.70
2 " " "	.56	.76
3 " " "	.64	.88
5 " " "	.74	1.03
8 " " "	.82	1.12

German Silver Sheets over 12 in. wide and weighing more than 1 lb., 2c ₩ lb. advance 2c. for each additional inch in width above 12 in. and 2c. ₩ lb on each No. thinner than Nos. 26 to 12, inclusive.

All German Silver thinner that No. 36 is Platers', at 4c. ₩ lb additional.

German Silver Scrap, one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 2c	$0.33	$0.37	$0.46
No. 21	.36	.40	.46
No. 19	.37	.41	.47
No. 23	.38	.42	.48
No. 24	.40	.44	.50
No. 25	.43	.47	.53
No. 26	.45	.49	.55
No. 27	.48	.52	.58
No. 28	.52	.56	.62
No. 29	.55	.59	.66
No. 30	.58	.62	.72
No. 31	.62	.66	.78
No. 32	.66	.70	.84
No. 33	.70	.74	.93
No. 34	.74	.78	1.03

Spring Wire 2c ₩ lb advance

Flat Square and Half-Round Wire 5c ₩ lb advance on Round Wire.

Fancy Wire not less than 10c ₩ lb advance on Round Wire.

Brass Rods, No. 8 and larger, not less than 2 feet lengths, 28c.

Wire straightened and cut smaller than No. 8 and not less than 2 feet lengths, 43c.

Wire and Rods less than 2 feet lengths, special rates.

Twelve cents per lb extra for spooling on 1 lb spools No 36.

MISCELLANEOUS.

Brass Pail Ears	$0.60
Brass Door Rail	.43

SCRAP.—Net.

High Brass Scrap	13c
Low Brass Scrap	10c
Gilding	10c

Turnings, Filings and Chips, all the price of Scrap.

Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis. 30 %. ₩ lb

Plain to No 20 inclusive above ¼ in. to 3 in.	$0.42
Plain above 3 in.	.52
Nos 21, 22, 23, two cents advance on List for each Number.	
Nos. 24, 25, 26, four cents advance on List for each Number.	
Above No. 26, special rates.	
Plain, ⅛ inch	7c
Plain, 3-16 inch	1.1c
Plain, ¼ inch	1.0c

All Mandrel Drawn Tubes, 5 cents advance on List Prices.

Fancy Tubing to No. 20	6c
English, Scotch and Extra Patterns Fancy Tubing to No. 20	5c

Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on Lis

Add two cents, ¼ cent for each additional cutting under 2 feet.

All Mandrel Drawn Tubes under 25 in. ⅝c ₩ lb advance.

ZINC TUBING—dis. 25 %.

Plain	27
Fancy	33
Scotch and Extra Patterns	36

GERMAN SILVER TUBING.—dis 25 %.

4 Per cent.	.80
6 Per cent.	.90
9 Per cent.	1.00
12 Per cent.	1.20
15 Per cent.	1.34
16 Per cent.	1.35
18 Per cent.	1.50
20 Per cent.	1.60

STEEL.—DUTY: Ingots, Bars, Sheets, &c., valued at 4c ₩ lb or less, 45% ad val. Valued above 4c and not above 7c ₩ lb, 2c ₩ lb; valued above 7c and not above 10c ₩ lb, 2¾c ₩ lb; valued above 10c ₩ lb, 3½c ₩ lb. *Extras.* Steel bars, rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, ½c ₩ lb in addition to above. Steel Circular Saw Plates, 1c ₩ lb in addition to the above.

American Cast Steel.

For American Steel see quotations under heading of Pittsburgh.

English Steel.

Best Cast	₩ lb 15½c
Extra Cast	₩ lb 16½c
Circular Saw Plates	₩ lb 16c
Round Machinery, Cast	₩ lb 10c
Swaged, Cast	₩ lb 18c
Best Double Shear	₩ lb 14½
Blister, 1st quality	₩ lb 13c
German Steel, Best	₩ lb 11c
2d quality	₩ lb 10c
3d quality	₩ lb 9c
Sheet Cast Steel, 1st quality	₩ lb 15½c
2d quality	₩ lb 14½c
3d quality	₩ lb 12½c

ANTIMONY See Trade Report

LEAD.—DUTY: Pig, $2 ₩ 100 lb Old Lead, 2c ₩ lb

Pipe and Sheet, 3c ₩ lb.

American	4½ @ 4¾c
Bar	.9c
Pipe	6½c. dis 10 %
Tin Lined Pipe	14c, dis 10 %
Sheet	7½c. dis 10 %
Shot	Drop 7c, Buck. 8c
Chilled Shot	.8c

BABBITT METAL.

N. P. U.	₩ lb 8c

A. 28c; B. 27c; C. 15c.

TIN.—DUTY: Plates, Sheets Tagger and Terne, 1c ₩ lb; Bars, Block and Pigs free.

Banca	₩ lb 23½c
Straits	₩ lb 22½c
English	₩ lb 23 c

TIN PLATES.

I C 10x14 / I C 14x20	Prime Charcoal	$6.25 @ 6.75
Second quality		$5.87½ @ 6.25
I C 12x12	Prime Charcoal	6.50
I X 10x14 / I X 14x20	Prime Charcoal	7.75 @ 8.00
Second quality		$7.25 @ 7.50
I X 12x12.	Prime Charcoal	8.25
D C 12½x17.	Prime Charcoal	5.75
D X 12½x17.	Prime Charcoal	7.25
For each additional X add		1.50

COKE TIN PLATE.

	Best.	Ordinary
I C 10x14	$5.50	$5.15 @ 5.40
I C 14x20		
I C 12x18	5.75	5.40 @ 5.50

TERNE PLATE.

	Prime Char.	3d Qual.	Coke.
I C 14x20	$5.50 @ 6.00	4.62½ @ 4.75	4.12½
I X 14x20	7.25 @ 7.50	....	....
I C 20x28	13.00 @ 14.00	11.25 10.50 @ 10.75	10.00 @ 10.25
I X 20x28	14.50 @ 15.00	....	....
I C 20x200	13.50	....	....
I C 14x20 M. F. Brand			$7.75

SOLDER—¼ & ½ 14c

Extra	13½c
No. 1	12 c

SPELTER.—DUTY: in Pigs, Bars and Plates, $1.50 ₩ 100 lb.

American, cash	5.00 @ 5.25

ZINC.—DUTY: Pig or Block, $1.50 ₩ 100 lb; Sheet 2½c ₩ lb.

Sheet, Cask	6¼ @ 6¼c
Sheet, Open	6¾ @ 7c

Paper Stock, &c.

(Dealers' Selling Prices.)

	Cents ₩ lb.
White Shirt Cuttings No. 1	7 @ 7½
White Shirt Cuttings, No. 2	6¼ @ 6
Mill Assorted Whites	5½ @ 5¾
Unbleached Muslins	6¼ @ 6¾
City Whites, No. 1	4½ @ 4¾
New Canton Flannels	6 @ 6¼
New Seconds light	3¼ @ 3½
New Seconds dark	2¾ @ 3
No. 2 Whites	3¼ @ 3¾
Cotton Canvas	4½ @ 4¾
Linen Canvas, No. 1	4¾ @ 5
Seconds, City No. 1	1½ @ 1¾
Seconds, City No. 2	1 @ 1¼
Colors, per cwt.	70 @ 90
Manila Rope	3¾
Manila Rope, Tarred	2½ @ 2¾
Gunny Bagging, No. 1	1¾ @ 2
Gunny Bagging, No. 2	1½ @ 1¾
Kentucky Bagging	4 @ 4¼
Burlap Bagging, No. 1	2¼ @ 2½
Tar Shakings	2 @ 2¼
Hemp Twine Stock	4¼ @ 4½
Hard White Shavings, No. 1	4 @ 4¼
Soft White Shavings, No. 1	3¼ @ 3¾
White Shavings, No. 2, soft	3
Mixed shavings, part white	2½ @ 3
Ledger and Writing	3 @ 3¼
Solid Stock	2½ @ 2¾
Book Stock, No. 1, light	1¾ @ 2
Old Newspapers	1¾ @ 1¾
Pure Manilas	1¾ @ 2
Bogus Manilas and Hardwares	1¾ @ 1
Commons per 100 lbs	60 @ 70
Binders' Board Cuttings	⅞ @ 1
Straw Board Cuttings per cwt.	70 @ 75

Paints, Oils, &c.

Paints.

Black Lamp, Coach Painters	₩ lb 22 @ 24c
Black Lamp, Ordinary	₩ lb 6c
Black Ivory Drop, fair	12 @ 15c
Black Ivory Drop, best	23c
Black Paint, in oil	kegs 8c; asst'd cans, 11c
Blue Prussian, fair to best	40 @ 45c
Blue Prussian, fair to best, in oil	45 @ 55c
Blue Chinese dry	70c
Blue Ultramarine	18 @ 30c
Brown, Spanish	1½c
Brown, Van Dyke	10 @ 12c
Green, Chrome	15 @ 23c
Green, Chrome, in oil	14 @ 18 @ 25c
Green, Paris	good, 20c; best, 25c
Green, Paris, in oil	good, 30c; best, 45c
Iron Paint, Bright Red	₩ lb 3 c
Iron Paint, Brown	₩ lb 1½c
Iron Paint, Purple	₩ lb 3 c
Iron Paint, Ground in oil, Bright Red	₩ lb 6½c
Iron Paint, Ground in oil, Red	₩ lb 5½c
Iron Paint, Ground in oil, Brown	₩ lb 5½c
Iron Paint, Ground in oil, Purple	₩ lb 5 c
Mineral Paints	2 @ 4c
Orange Mineral	10c
Red Lead, American	7c
Red Venetian (Eng.) dry	$1.65 @ $1.70
Red Venetian, in oil	asst'd cans, 11c; kegs, 8c
Red Indian dry	9 @ 12c
Rose Pink	10 @ 13c
Sienna, American, Raw, powdered	3c
Sienna, Burnt, powdered	4½c
Sienna, Burnt, in oil	10 @ 16 @ 20c
Sienna, Raw	11 @ 14 @ 25c
Umber, Burnt, powdered	4 @ 8c
Umber, Burnt, in oil	9 @ 12 @ 15c
Umber, Raw, powdered	3½ @ 7½c
Umber, Raw, in oil	10 @ 16 @ 20c
Vermilion, Chinese	50c
Vermilion, English	40 @ 45c
Vermilion American, Common	15c
White Lead, American, pure dry	6½ @ 6¾c
White Lead, American, pure in oil	6½ @ 7c
White, Paris, English, prime	in bbls. 2 @ 3 c
Yellow Ochre, French	$1.75
Yellow Ochre, French, in oil, asst'd cans, 11c; kegs, 8c	
Yellow Ochre, Vermont	in casks, 1½c
Yellow Chrome	17 @ 27c
Yellow Chrome, in oil	14 @ 18 @ 24c
Zinc White, American No. 1, dry	5 @ 6c
Zinc White, American No. 1, in oil	9c
Zinc White, French (Paris) dry	8 @ 10c
Zinc White, French, in oil	10 @ 11c

Oils.

Linseed Raw, in casks and bbls	56 @ 57c
Linseed Boiled, in casks and bbls	60 @ 60c
Linseed, Calcutta	58 @ 59c
Bleached Whale	₩ gal. 70c
Bleached Sperm	₩ gal. $1.20
Bleached Elephant	70
Signal	75c
Prime Lard	60c
No. 1 Extra	52c
West Virginia	12c @ 18c
Drilling	40c
Miners' Oil	40c @ 42c
Fish Oil, pressed	42c @ 45c
Neatsfoot	70c @ 80c
Tallow	70c @ 75c
Empire Cylinder Oil	55c
Machinery	50c
Engine	45c

Sundries.

Asphaltum Cuban	6½c @ 9½c
Asphaltum Egyptian	90 @ 10
Benzine	₩ gal. 8c @ 10c
Chalk	75c
Chalk Block	80c
Dryers Patent Am'n	ass't. cans, 9c; kegs 7c
Frostings	4c
Glue, White	24 @ 35c
Glue, Sheet	20c
Glaziers' Points, Zinc	8c
Gum, Copal	36c
Gum, Damar	25c
Gum Shellac, English	40c
Gum Shellac, English, dark	35c
Litharge	7½c
Mineral Wool, ordinary	₩ lb 1 @ 1½c
Mineral Wool, extra	₩ lb 3 @ 3½c
Pumice Stone, selected Lumps	4 @ 6c
Pumice Stone, Powdered	2½c
Pine Tar, bbls	$2.75
Pitch	$1.90
Putty, in bladders	3c
Putty, in bulk	2½c
Rosin—Common and Good—Strained	$1.90
E & F	$2.10 @ $2.20
G & H	$2.30 @ $2.50
I & K	$2.60 @ $2.80
M & N	$3.00 @ $3.25
Spirits Turpentine	41 @ 42c
Whiting Spanish	75c
Waste, No. 1 Cop	10c
Waste, No. 1 White Machine	10c
Waste, No. 2 White Machine	9½c
Waste, No. 1 Colored	7c
Waste, No. 2 Colored	6½c
Waste Washed Machine	c

Glass.

Prices current per box of 50 feet.
List, July 2, 1883.

Single.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$13.50	$11.50	$10.75	$10.25
11 x 14 to 16 x 24	14.50	13.50	12.50	11.50
18 x 22 to 20 x 30	18.50	17.00	16.50	14.00
15 x 36 to 24 x 30	20.50	18.50	16.25	
26 x 28 to 24 x 36	22.00	20.50	17 50	
26 x 36 to 26 x 44	24.00	22.00	18.50	
26 x 46 to 30 x 50	26 00	24 00	20.50	
30 x 52 to 30 x 54	27.00	25.00	21.50	
30 x 56 to 34 x 56	29.00	27.00	24.00	
34 x 58 to 34 x 60	31.00	29.00	26.00	
36 x 60 to 40 x 60	35.00	31.00	29.00	

Double.

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$17.50	$15.00	$14.00	$13.00
11 x 14 to 16 x 24	20.00	18.00	16.50	
18 x 22 to 20 x 30	24.00	22 00	20.00	
15 x 36 to 24 x 30	26.50	24.00	21.00	
26 x 28 to 24 x 36	30.00	28.00	23.00	
26 x 36 to 26 x 44	33.00	31.00	27.00	
30 x 42 to 30 x 54	35 00	32.00	28.00	
30 x 56 to 34 x 56	37.00	34 00	30.00	
34 x 58 to 34 x 60	40.00	37.00	32.00	
36 x 60 to 40 x 60	43.00	40.00	37.00	

Sizes above—$15 per box extra for every 5 inch s. An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 84 united inches, will be charged in the united 84 inches bracket D scount, 7s and 5

The Divining-Rod.*

BY ROSSITER W. RAYMOND.

The extent to which the divining-rod is still used in this country for the detection of hidden treasure, mineral veins or springs, is much greater than educated persons would be likely to suppose. For many years wells have frequently been located by its aid in New England, where the belief is widely extended among the farmers that in the hands of peculiarly gifted persons this instrument possesses special virtue. Large numbers of the oil wells of Pennsylvania have been bored at points designated by the so-called "oil-smellers." More than one adept with this instrument is practicing now in the Western mining region. I encountered, a few months ago, in Southern Colorado, a party of capitalists who were accompanied by such an expert, and whose purpose was to discover a mine by his aid, and to buy the property thus made valuable. Still more recently a paragraph in the Tombstone *Epitaph*, of Arizona, announced that a party of gentlemen from Chicago, whose names were given, had been scouring over the hills in the neighborhood of Tombstone for more than a week, in company with an expert of Colorado, who had been employed to ascertain "with his well-known divining-rod" the localities of mineral wealth, and who had declared the existence of large bodies of ore in at least two places not yet developed. It is also reported, with what truth I do not know, that the Central Pacific and Southern Railroad companies have employed the divining-rod successfully in the discovery of water, and have located by this means their artesian wells in the desert. Last, but not least, a small book entitled "The Divining-Rod," and published in Cleveland, in 1876, contains an essay on this subject, read before the Civil Engineers' Club of the Northwest, at Chicago, in 1875, by Mr. Charles Latimer, a well-known engineer who has had charge of several important railways, and who testifies in the most unqualified manner to the virtues of the divining-rod as a means of determining the position and the depth of subterranean water-courses, and claims to have discovered certain new and important laws of its operation connecting, if not identifying, it with the force of electricity.

These circumstances, taken together with the fact that the "dowsers," or experts with the rod, still enjoy considerable local authority in Cornwall, and that believers in its efficacy may still be encountered among the German miners (although I think in that country the faith is more nearly extinct than elsewhere), certainly justify me in regarding this subject as one not solely of historical interest. Yet a consideration of its history and literature will throw important light upon the question, whether the phenomena which it has presented, and continues to present, are to be ranked under the head of self-delusion, deliberate deceit, or both; or, on the other hand, indicate, after all reasonable deductions for human error and credulity, a residuum of important scientific truth.

Before sketching the history of this instrument it will be well to say a few words concerning its form, material and use. Yet this is a work of no little difficulty. The immense literature of the divining-rod shows nothing more clearly than the boundless confusions and contradictions of its advocates and professors. Of the dozen different schools of practice, each is necessarily obliged to reject half of the asserted principles and certified facts put forward by the rest. The most common divining-rod, perhaps, has always been a forked branch of witch-hazel in the shape of the letter Y. This wood may have been selected because it forks in such a way as to give two branches of equal size, or because of its supposed affinity for springs of water. But other woods, such as peach, ash, pitch-pine, and even metals, have been recommended at different times, and different professors of the art have also varied the shape of the rod, employing sometimes a straight twig with a small fork only at one end, or an elastic twig or whalebone without any fork. The dowsing-rod used by the expert mentioned in the Tombstone *Epitaph*, is, I believe, an instrument made of two prongs of whalebone united in a stem which terminates in a case similar to a rifle cartridge. The contents of this case are a secret. (Similar cases, used in the Middle Ages, are said to have contained mercury.) This rod, like the ordinary forked hazel switches, is held in the two hands, each grasping the extremity of a prong, with the fingers closed not too tightly and the palms upward, the shank or stem of the rod being horizontal or vertical, or variously inclined, according to the principles of the practitioner. When carried in this manner by the operator, walking over the surface of the ground, the rod is said to turn or dip above treasure, mineral veins, springs, &c.; but there is an elaborate and complicated science based upon the various degrees, directions and force of this dipping. Unfortunately, the rules as determined by one or another celebrated operator have been found not to work for his rivals or successors, so that each authority lays down rules of its own. The straight rods were either balanced in various ways on one or both hands, or sprung bowlike between the two hands. The most peculiar rod described in ancient books was made of two pieces of wood, one of which was pointed and the other provided in the end with a socket. This rod, being delicately held, was said to indicate the presence of the object sought for by a peculiar revolution of the point in the socket.

An inquiry into the uses of such rods leads us at once to the history of our subject, in the study of which it will appear that divining-rods were first used in antiquity mainly or wholly for moral purposes; that in the Middle Ages their employment was for a long period confined to the discovery of material objects; that toward the end of the seventeenth century the moral use was again asserted, and that in the eighteenth century the divining-rod was relegated to the material sphere, and assumed the comparatively modest functions in the discharge of which it still lingers among us. I would recommend to those who have not the means of an extended research the perusal of the book of Professor Fiske, of Harvard, on "Myths and Myth Makers" (Boston, 1873), in the second essay of which, on "The Descent of Fire," this subject is treated in the light of comparative mythology; also the work of Louis Figuier, "Histoire du Merveilleux dans les Temps Modernes" (Paris, 1860), half of the second volume of which is devoted to the divining-rod; and, finally, the book of Chevreul, "La Baguette Divinatoire" (Paris, 1853), which is a conclusive summary from the standpoint of modern science and experiment. I do not mention the work of Mr. Baring-Gould, "Curious Myths of the Middle Ages," which Professor Fiske compliments with frequent quotations, for the simple reason that Mr. Baring-Gould's essay on the divining-rod is made up almost wholly of portions of Figuier's work, often translated *verbatim* and without credit. A brief, interesting and impartial discussion of the divining-rod from the standpoint of the Middle Ages, together with a curious engraving illustrating its use, will be found in the well-known work of Agricola, "De Re Metallica," (Basle, 1546), published in the sixteenth century both in Latin and in German, copies of which, though not very common, are still to be met with in the antiquarian bookstores of Europe. I believe the library of the School of Mines of Columbia College contains a German copy. In the preparation of this paper I have made use of the Latin edition, which is the only one in my possession. An excellent summary of the subject, containing many curious details will be found also in Prof. Moritz Gaetzschmann's "Auf-und Untersuchung der Lagerstätten" (Freiberg, 1857). The Brooklyn Library contains a copy of a work entitled, "Jacob's Rod. A Translation from the French of a Rare and Curious Work, A. D., 1693, on the Art of Finding Springs, Mines and Minerals by means of the Hazel Rod. To which is Appended Researches, with Proof of the Existence of a More Certain and Far Higher Faculty, with Clear and Ample Instructions for Using it." Published by the translator, Thomas Welton, 13 Grafton street, Fitzroy Square, London. This book was published, I believe, in 1875. The title-page bears no date. The original French treatise, the translation of which occupies the first part, is probably the one entitled "La Verge de Jacob, ou l'Art de Trouver les Trésors," which Figuier (Histoire, &c.; vol. ii, p. 257) speaks of as well known to the adepts in occult sciences, and Chevreul (La Baguette, &c., p. 30) mentions as an example of the use of the term "Jacob's Rod" in those sciences, to signify a rod possessing marvelous properties. The origin of this signification will be found in Genesis, xxx. I suspect that neither Figuier nor Chevreul had seen this book; both of them fail to give either the name of the author or the date of publication, an omission especially noticeable in the case of Chevreul, who is usually both full and careful in his references. The translator gives the date as 1693, and names the author as M. Baritel. Of the fidelity of the translation I have no guaranty except internal evidence, from which I judge that it is honest rather than intelligent. This translator, Mr. Walton, is himself a mesmerist, an electro-biologist, and declares his wife to be possessed of clairvoyant powers, of the exercise of which he believes the discovery of water, metals, &c., to be but one sub-division. The object of his translation and "addenda" is to connect the ancient phenomena of rhabdomancy, the observations and theories of Reichenbach, the fanciful speculations of Bulwer-Lytton, and numerous modern wonders (accounts of which he extracts from the *Spiritual Magazine*), and his own and his wife's alleged experience. To the works above named I am indebted for nearly all the facts cited in this paper, and for many quotations made at second hand.

Professor Fiske, following Dr. Kuhn, whose treatise on the "Descent of Fire" was published in Berlin in 1859, traces the divining-rod to a widespread Aryan myth, connected with the forked lightning. Without going so far back, we may find in written history many evidences of the use of the rod, not only as a symbol of earthly power, but also as the instrument of supernatural effects, and particularly of divination. It will be remembered that the Egyptian sorcerers, confronted by Moses, carried rods, as Moses and Aaron also did. The prophet Hosea denounces the use of rods for divination by the Jews (Hosea 4:2). According to another prophet (Ezekiel 21:26) the King of Babylon consulted rods or arrows to decide his course. The Scythians, Persians and Medes used them. Herodotus says that the Scythians detected perjurers by means of rods. The word Rhabdomancy, originated by the Greeks, shows that they practiced this art, and the magic power of the rods of Minerva, Circe, and Hermes or Mercury, is familiar to classical students. The Lituus of the Romans, with which the augurs divined, was apparently an arched rod. Cicero, who had himself been an augur, says in his treaties on divination that he does not see how two augurs, meeting in the street, could look each other in the face without laughing. At the end of the first book of this treatise he quotes a couplet from the old Latin poet Ennius, representing a person from whom a diviner had demanded a fee as replying to this demand, "I will pay you out of the treasures which you enable me to find." This ancient joke, by the way, has been adopted in all seriousness by the "oil-smellers" of Pennsylvania, who, as I am informed, are accustomed to locate oil wells on precisely this condition, receiving nothing if the well proves unsuccessful, and $50 if oil is struck.

Marco Polo reports the use of rods or arrows for divination throughout the Orient, and a later traveler describes it among the Turks. Tacitus says that the ancient Germans used for this purpose branches of fruit trees. One of their tribes—the Frisians—employed rods in church to detect murders. Finally, if we may trust Gonsalez de Mendoza, the Chinese, who seem to have had everything before anybody else, used pieces of wood for divination. Thus we perceive that the application of the divining-rod in historical antiquity was mainly or wholly moral; that is, it was employed to detect guilt, decide future events, advise courses of action, &c. There are but two passages which have been quoted to prove its use for physical purposes—one from Ctesias (*apud. phot. bibl. cod.*), who speaks of a rod of the wood *Parebus*, which attracted gold, silver, other metals, stones and several other things; the other from Cicero ("De Officiis," lib. i.), who says: "If we could obtain with the so-called divine rod everything pertaining to food and clothing" (*ad victum cultumque*), &c.

On the other hand, the silence of many authors is significant, as Chevreul has pointed out. Varro does not mention the use of the rod for the discovery of subterranean waters or metals. Vitruvius, discussing the means of discovering springs, says nothing of it. Pliny, in Book XXX of his "Natural History," omits it from his enumeration of magical arts and methods, and in Book XXXI, describing (after Vitruvius) the means of discovering springs, and in Book XXXIII, describing explorations for metals, is equally silent concerning it. Columella, Palladius, and in the sixth century Cassiodorus, are likewise dumb, though the latter in one of his epistles ("Theodoric LIII") extols the utility of the professional water-discoverers Even as late as 1569 a book printed in Orleans ("L'art et Science de Trouver les Eaux et Fontaines Cachées sous Terre Autrement que par les Moyens Vulgaires des Agriculteurs et Architectes," par Jacques Besson, Dauphinois, mathematicien), contains no allusion to the rod. It is a curious circumstance that this work emanated from Dauphiny, the home, a century later, of the most famous diviners and water discoverers.

But the alchemistic literature brings the physical uses of the divining-rod to the front. The first mention is usually credited to the "Novum Testamentum" of Basil Valentin, a Benedictine monk and hermeneutic philosopher of the fifteenth century. But it must be remembered that the existence, even, of this man is not beyond doubt. It is attested by Gaderus "Historia Erfordiensis," (1675), who says that Basil was living at the convent of St. Peter's, at Erfurth, in 1413. Yet the "Testamentum" was actually first printed at the beginning of the seventeenth century, though manuscript copies had been circulated earlier. Of these, Chevruel possesses one (a French translation) dated 1651, and from it quotes the famous passage according to which, at the time of the writer, the divining-rod was worn in the belt or the hat, and was used to discover metals. Basil describes seven varieties of the rod, according to its different motions. Whatever its antiquity, the use of the rod to discover hidden treasure or metallic ore became general in Germany, and was extended thence through Flanders, England, Sweden, France, Italy and Spain before the end of the seventeenth century. It must be remembered that in those days the practice of burying money and plate was universal. A rod that would discover buried treasure only would, at the present time, be of comparatively little value. We know well enough where the large masses of gold and silver are piled. It is not ignorance, but bolts and bars, that prevent our getting at them; and a large class of the diviners of the Middle Ages would be obliged, if they lived to-day and practiced their profession, to become burglars or cashiers.

The scientific explanation of the divining-rod at this period, like the scientific explanation of nearly all facts in chemistry and physics, was "affinity," a word under which was concealed a little science together with a vast amount of ignorance and superstition. Philip Melancthon (1497–1560), the friend of Luther, adopted this theory to explain the effects of the divining-rod. We must confess that in an age when the attraction of the magnet for iron and of electrified amber for light bodies was known, but not understood, there was no necessary absurdity in supposing that similar phenomena might be exhibited by other classes of substances. And this natural presumption, joined with the inherent credulity of ignorance and the tendency to generalize upon imperfect data, caused a very general acceptance of the alleged operations of the divining-rod as true, and consequently the promulgation of crude quasi-scientific theories to account for it. On the other hand, it must be remembered that the belief in demoniac agencies was still active and all-pervading, so that when facts could not be scientifically explained they were at once referred to witchcraft or to the devil direct. So long as the discussion remained within the field of science it was conducted with courage and candor; but when it entered the demoniac domain, the boldest philosopher, unless he were willing to sell his soul to Satan, became dumb. This may explain the attitude of the great Agricola ("De Re Metallica," lib. ii.), a keen observer and wise reasoner, who, after saying that the alleged virtues of the divining-rod are subject to much dispute, and stating both sides of the dispute with admirable clearness, demolishes in a few words the supposed analogies of magnetism and electricity, but declares that if the divining-rod derives any power from spells and incantations, that is a matter neither permissible nor agreeable for him to discuss. He proceeds, moreover, to assert as the general result of experience in his time that the professors of the divining-rod, though they sometimes succeed in discovering veins, quite as frequently fail, and have to dig like other people if they wish to find anything. Wherefore, he advises the respectable and sober miner to study the indications of nature, and then dig at once, without further fooling. In the quaint woodcut which accompanies this passage a miner is represented in the background as cutting his hazel twig, while another in the foreground is proceeding with it in due form for the discovery of the mine; and (whether in sarcasm or not, I do not undertake to say) at the very point to which the latter is steering, two of Agricola's "good and sober" miners have already found ore by the homely process of digging.

Paracelsus (1495-1541) condemns in his works, as uncertain, illusory and unlawful, the use of the rod His disciples did not uniformly agree with this view. Goclenius, author of "Essays on the Virtue of Plants and the Unguent of Arms," believes in the efficacy of the rod and does not condemn its use. Libavius, author of the "Syntagma Arcanorum Chamicorum" (died 1616) believed in it from experience, and explains its action by sympathetic affinity. This theory, already announced by Melancthon, was also held by his son-in-law, Peucer, by Porta "Magia Naturalis," (1569, lib. xx., cap. viii.), by Keckerman (1573-1609), "Systemata Physica" (lib. i., cap viii.), by the author of one of the discourses published with those of Maiolus, Bishop of Volturara (1614), and by Michael Mayer, the prolific author of alchemistic allegory, "Verum Inventum, hoc est Munera Germaniæ" (cap. iv.), who, describing the invention of gunpowder in Germany and the use of hazel-charcoal in its original manufacture, mentions the sympathy which hazel-wood has for metals, and its consequent employment in the form of the divining-rod. On the other hand, the Jesuit father Laurentius Forer, "Viridarium Philosophicum seu Disputationes de Selectis in Philosophiâ Materiis," (1624), condemns the use of the rod as a superstitious practice. We must distinguish, therefore, three different views of the question; two of which accepted the efficacy of the rod as proved, and ascribed it respectively to a physical property of the rod, and to demoniac agency, while the third discredited the alleged facts, and pronounced the practice to be a superstition.

A fourth view was indeed advanced, according to which the operator, as well as the rod, was the recipient of a divinely-given faculty. It was no doubt with the purpose of avoiding the odium attached to dealings with the Evil One that the professors of this science, particularly in Germany, surrounded it with ceremonies and formulas of a highly pious character. It is true that the rules sometimes prescribed for the cutting of the twig partook largely of heathen sorcery and astrology. They were indeed, to some extent, unconscious reminiscences of the old Scandinavian, and even of the Aryan, mythology. But this was atoned for when the rod was duly Christianized by baptism, being laid for this purpose in the bed with a newly baptized child, by whose Christian name it was afterward addressed. The following formula, cited by Gaetzschmann, may serve as an example. "In the name of the Father, and of the Son, and of the Holy Ghost, I adjure thee, Augusta Carolina, that thou tell me, so pure and true as Mary the Virgin was, who bore our Lord Jesus Christ, how many fathoms is it from here to the ore?" In this case, the rod was expected to reply by dipping a certain number of times, corresponding to the number of fathoms. Such devices, however, were not everywhere successful in diverting from the practitioners of this occult science the evil name of sorcery. A striking and pathetic instance is furnished in the seventeenth century by the history of the Baron and Baroness Beausoleil. The Baron, born in Brabant, devoted himself to mineralogy and mining, and became, undoubtedly, one of the foremost mine engineers of his time. He visited and studied the mines of Germany, Hungary, Bohemia, Tyrol, Silesia, Moravia, Poland, Sweden, Italy, Spain, Scotland, England and France. The emperors Rudolph and Mathias appointed him counsellor and commissioner-general of the mines of Hungary. The Archduke Leopold made him director of the mines of Tyrol and Trent. The dukes of Bavaria, Neuburg and Cleves gave him the same title. Finally, the Pope did the same for all the Papal States. He appears to have amassed from these various employments a considerable fortune.

In 1600 he was engaged by the comptroller-general of the mines of France to open mines in Languedoc and some other provinces, and in 1626 this commission was still further extended. During this period he met and married his wife, who devoted herself with enthusiam to his profession, studying and traveling extensively with him in Germany, Italy, Sweden, and perhaps Spain. They even made a voyage to the shores of the New World. In 1627 their house was robbed under the legal forms of search on the charge of sorcery preferred by a local official. Their loss was estimated at 100,000 crowns. They easily obtained acquittal of the charge; but it is an instructive commentary on the justice of the time that they never were able to recover their property. They went to Hungary, but returned to France in 1632 under a new commission from Louis XIII. In this year the baroness, who was an accomplished author, published an account of 150 mines already discovered in France, and of some medicinal springs. They expended, in further explorations, nearly the whole of their fortune, but were unable, in the face of their jealous rivals and enemies, to obtain from the Government the grants which had been promised them, and by means of which they expected to reimburse themselves. Finally, the baroness published a work, addressed to Richelieu, and entitled "The Restitution of Pluto" (reprinted at Paris in 1779), in which, with eloquent indignation, she declared the deserts of her husband and herself, and asserted their right to the rewards promised them, urging the cardinal minister at the same time, by every consideration of the glory and greatness of France, to encourage the development of its mineral resources. Unfortunately, in this work she furnished new material for the slanderous accusation of sorcery. In magnifying the art of discovering mines and springs, and the skill required for this purpose, she gives a description of the means employed, showing that these hidden treasures are to be detected:

1. By digging, which is the least important way.

2. By the herbs and plants which grow above springs of water.

3. By the taste of the waters which flow from them.

4. By the vapors which arise from them at sunrise.

5. By the use of 16 scientific instruments and of seven rods (the seven rods of Basil Valentin) connected with the seven planets, &c.

The first four means were undoubtedly real and really employed. Under the fifth head we have an illustration of what is so common in the alchemistic and other mediæval writers, namely, the covering of the facts of nature and the methods of investigation with assumed mystery, to hide them from the vulgar. So long as the baron and baroness were spending their own money for the good of the State, they were permitted to go on, and even received complimentary notices from time to time, which, indeed, could not be withheld from persons of such eminent reputation. But when they became troublesome in their demands for more substantial favors and came into collision with the "rings" which infested the kingdom, the charges of sorcery renewed against them furnished a convenient pretext for putting them out of the way. Richelieu may even have supposed that he was behaving in this case with lenity, since instead of having them burned to death, as he did with another sorcerer of the same period, he only put the baron in the Bastille (1642) and his wife in Vincennes, where they soon (about 1645) died in destitution and misery, victims not so much of the superstition as of the corruption of the times. It will be noted that the treatise of the baroness did not claim from the divining-rod any moral virtue. What the Beausoleils appear to have done for this instrument was to bring forward its use in the discovery of springs as well as metals. The literature of that period seems to ignore in the main any powers of the rod in prophecy or moral discrimination.

The Jesuit father, Cæsius, "Mineralogia" (1636), inclines to deny the efficacy of the rod. Robert Fludd, "Philosophia Moysaica" (1638), after mentioning the sympathy existing between the crab or oyster and the moon, between the rue and the fig-tree, between myrtle and the pomegranate, adduces as an instance of similar sympathy between plants and minerals the dipping of a hazel-rod over a vein of silver or gold. The celebrated chemist, Rudolph Glauber "Pars Seconda Operis Mineralis" (1652), affirms from experience, and attributes to a physical property, the efficacy of the rod in exploring for metals. The Jesuit father, Jean François, "Science des Eaux" (1653), seems to admit the power of the rod to discover springs, but condemns its use. The erudite Jesuit father, Kircher, "De Arte Magnetica" (1654), "De Mundo Subterraneo" (1678), having proved by experiment that rods of wood alleged to be sympathetic with certain metals, were, when balanced upon pivots, not at all affected by the proximity of these metals, concluded that the sympathy was chimerical. In his later work he declared roundly that if the movement of the rod did not proceed from a joke or a cheat on the part of the operator, it was not natural, and ridiculed those who fancied it could be caused by a vapor disengaged from the metal.

Edo Neuhusius, "Sacrorum Fastidicus" (1658), believes in the working of the rod, and attributes it to a sympathy, or to the stars, or some other cause. The Jesuit father, Gaspard Schott, "Physica Curiosa" (1662), pronounces the use of the rod superstitious, or rather diabolical. But he adds in a foot-note that pious and honest men have assured him both with regard to the turning of the rod and with regard to the striking of the hours by a ring suspended within a glass (*pulsum annuli filo intra scyphum suspensi et horas indicantis*), that the experiment does not always succeed, and hence he will not assert that the demon is always acting. The argument appears to be that, if the devil had it in hand, it would not fail. The pious and honest men aforesaid also protested that the phenomenon was natural and not due to fraud or fancy. "*Sed nondum persuaserunt*," pithily concludes Schott. The passage is noteworthy as containing a reference to the wonderful pendulum, which became, at a later day, the subject of scientific treatises, and still survives as a puzzle and amusement for children for all growths. Sylvester Rattray, "Theatrum Sympatheticum" (1662), believes in the sympathy of vegetables with minerals. According to him, the hazel is suitable for the discovery of silver, wild pine for lead, olive and palm for gold and silver.

It was in 1666 that Robert Boyle put the question, as member of the Royal Society of London, whether the divining-rod is really moved by the proximity of metal—a pertinent inquiry which no one seems to have answered by authoritative and thorough experiments, unless we may accept as sufficient those of Kircher, above mentioned. The accumulation of contradictory testimony from witnesses of all degrees of competency went on. Matthias Willenius, a German author, published in 1671 or 1672 a book called "A True Account of the Rod of Mercury," in which, as the title indicates, he appealed to astrology for the partial explanation of his theme, asserting that the influence of the stars under which the operator is born contributes to the turning of the rod over metals, "by the effect of the harmony established between heaven and earth." Fromm nn, "Tractatus de Fascinatione" (1674), says that, after long hesitation, he has decided that the use of the rod is lawful. The Jesuit father, Dechales, "De Fontibus Naturalibus" (1674), inclines to the same opinion, and speaks of the hazel as having been in all times (*omni tempore*) used as an index to springs. This is a curious illustration of the rapidity with which a tradition may come to be considered immemorial. In fact, if we except the striking of the rock in the desert by Moses—which is certainly not a case in point—the first trace of the use of the rod for discovering springs is in the works of the Beausoleils, scarcely 50 years before Dechales wrote his treatise.

Le Royer, a lawyer of Rouen, published in 1674 his "Traité du Bâton Universal," and in 1677 his "Traité des Influences et des Vertus Occultes des Etres Terrestres." He declares that the rod by its sympathetic virtue can discover all hidden objects, metals, springs, &c. But he ascribes to it no moral power. The Abbé Hirhaïn, "De Typho Generis Humani, sive Scientiarum Numanarum Inani ac Ventoso Humore, &c." (1676), while scoffing at many reviewed beliefs, admits without question the efficacy of the divining-rod. St. Romain "La Science Naturelle Degagée des Chimères de l'Ecole" (1679), was one of the first believers in the rod to reject the sympathies and antipathies, and to substitute the Cartesian corpuscular hypothesis—of which I shall have more to say hereafter. Finally, the celebrated botanist, Ray, "Historiedes Plantes" (1686), classed the divining-rod among superstitions.

(To be continued.)

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* Read at the Boston meeting of the American Institute of Mining Engineers, February, 1883.

At the beginning of 1882 Sweden possessed a mercantile navy of 4151 vessels, measuring 530,000 tons, of which 3397 were sailing vessels, with 450,000 tons, and 754 steamers, with 80,000 tons. The number of sailing vessels during the year exhibited a decrease of 184 ships.

New York Wholesale Prices, September 19, 1883.

(For Wholesale Metal Prices See Page 29.)

HARDWARE.

Anvils.
Eagle Anvils American. .... ₩ ℔ 10c—dis 20 %
Wright's..........................11c @ 11¼c
Armitage's Mouse Hole.................9½c @ 9¾c
Armitage's Mouse Hole (extra quality)...........11½
Trenton 10½c
Wilkinson's.....................................10½c
Anvil Vise and Drill.
Millers Falls Co., $18.00 .... dis 20 %
Cheney Anvil and Vise...........................dis 33⅓ %
Augers and Bits.
Conn. Valley Mfg. Co. / Douglass Mfg. Co. / C. E. Jennings & Co. / Humphreysville Mfg. Co. / Ives / Beecher (French, Swift & Co.) / Griswold / Nobles Mfg. Co. / Snell Mfg. — dis 55@60 % from list of Jan. 7, 1880.
Cook's Douglass Mfg. Co.......................dis 40&10 %
Patent Solid Head.................................dis 30 %
Lewis' Patent Single Twist.........................dis 45 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand Rail bits..........................dis 10&10&10 %
Russell Jennings' Augers...........dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers......dis 25&10&10&10 %
Imitation Jennings' Bits.............................dis 50 %
Ives' "Jennings'" Bits..........................dis 40&10 %
Snell Mfg. Co.'s Jennings' Bits......................dis 40 %
Expansive Bits, Clark's, small, $18; large, $26., dis 25 %
Expansive Bits, Ives'............ $20@$30—dis 33⅓&10 %
Expansive Bits, Blake's.......................$20—dis 40 %
Expansive Bits, Derby, $17 and $26................dis 40 %
Hollow Augers, Ives / Hollow Augers, French, Swift & Co. .... dis 25 %
Hollow Augers, Douglass'.............................25 %
Hollow Augers, Bonney's Adjust. ₩ dz. $48—dis 25&10 %
Hollow Augers, Stearns' Adjust. ₩ dz. $48—dis 20&10 %
Hollow Augers, Ives' Expansive, each $4.50—dis 30&10 %
Hollow Augers, Universal Expan., each $4.50—dis 20 %
Wood's...dis 25 %
Gimlet Bits..........................$7.50 ₩ gross, dis 50 %
Gimlet Bits, Diamond...........₩ doz. $1.10, dis 25&10 %
Gimlet Bits "Bee"....................................dis 25 %
Double Cut Gimlet Bits, Shepardson's ....dis 45 %
Double Cut Gimlet Bits, Ct. Valley Mfg. Co. dis 30&10 %
Double Cut Gimlet Bits, Hartwell's...................dis 60 %
Double Cut Gimlet Bits, Douglass'...................dis 40 %
Double Cut Gimlet Bits, Ives'........................dis 50 %
Morse's Bit Stock Drill.........................dis 25&10 %
Holtz Bit Stock Drills............................dis 25&10
L'Hommedieu's Ship Augers......................dis 15 %
Awl Hafts.
Sewing, Brass Ferrule ....$3.50 ₩ gross—dis 40&10
Patent Sewing, Short..........$1.00 ₩ doz.—dis 40&10 %
Patent Sewing, Long...................$1.20 ₩ doz.—net
Patent Peg, Plain Top.........$10.00 ₩ gross—dis 40&10 %
Patent Peg, Leather Top .. $12.00 ₩ gross—dis 40&10 %
Awls, Brad Sets, &c.
Awls, Sewing, Common ... ₩ gross $1.70—dis 25&10 %
Awls, Shouldered Peg.........₩ gross $2.45—dis 25&10 %
Awls, Patent Peg.....................₩ gross 63c—dis 25&10 %
Awls, Shouldered Brad........₩ gross $2.70—dis 25&10 %
Awls, Handled Brad...........$7.50 ₩ gross—dis 25&10 %
Awls, Handled Scratch.........$7.50 ₩ gross—dis 25&10 %
Awls, Socket Scratch............$1.50 ₩ gross—dis 10&10 %
Brad Sets, Aiken's............... ₩ doz $10.00—dis 50&10 %
Millers Falls Adj. Tool Hdles... ₩ doz $12—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50......dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $9.60...dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 2, $1.80...dis 30&10 %
Brad Sets, Stanley's Excelsior, No. 3, $7.80...dis 30&10 %
Axes.
Single Bit, 4½ to 5½ and under..........₩ doz 8.00 net
Single Bit, 4½ to 6 and over................₩ doz $8.50 net
Single Bit, beveled.................50c ₩ doz advance
Double Bit, 4½ to 5½ and under. ....₩ doz $15.00 net
Double Bit, 4½ to 6 and over...........₩ doz $16.00 net
Double Bit, beveled ....$1.00 ₩ doz advance
Axle Grease.
Frazer's..₩ ℔ 6c
Axles.
Standard list ....dis 45 %
Balances.
Spring Balances. ....dis 33⅓ %
Bells.
Hand, Light Brass......................................dis 70&10 %
Hand, Extra Heavy.......................................dis 45 %
Hand, White Metal..dis 60 %
Hand, Silver Chime....................................dis 20&10 %
Hand, Globe (Cone's Patent).......................dis 25&10 %
Gong, Abbe's..dis 20&10 %
Gong, Yankee...dis 30&10 %
Gong, Barton's...dis 30&10 %
Crank, Taylor's..dis 25&10 %
Crank, Brooks'.....................................dis 50&10&2 %
Crank, Cone's..dis 10 %
Crank, Connel's.......................................dis 15&10 %
Lever Sargent's..dis 55&10 %
Lever, Taylor's Bronzed or Plated.......................net
Lever, Taylor's Japanned...........................dis 25&10 %
Lever, R. & E. M. Co.'s.........................dis 50&10&2 %
Lever, Reading.....................................dis 25&10&10 %
Pull, Brook's.....................................dis 50&10&2 %
Pull, Western...dis 25&10 %
Call..dis 25 %
Cow, Common Wrought.............................dis 55&10 %
Cow, Western,..dis 20&10 %
Cow, Western, Sargent's new list.........dis 60&10&10 %
Cow, Kentucky "Star"................................dis 20&10 %
Cow, Kentucky Sargent's new list ......dis 60&10&10 %
Cow, Dodge' Genuine Kentucky, newlist—

Nos.	0	1	1½			4	5	6	Hog	
	$12.00	10.0	9.0	8.00	7.00	5.00	3.50	2.50	5.00	dis 60 %

Cow, Texas Star ....dis 40&10 %
Bellows.
Blacksmiths Common.....................................dis 45 %
Blacksmiths' Extra Pittsburgh Pattern...........dis 20 %
Molders'..dis 25 %
Hand Bellows...dis 20 %
Belting, Rubber.
Belting and Packing Co...............................dis 50 %
Bit Holders.
Extension, Barber's...........₩ doz $15.00—dis 40&5 %
Extension, Ives'..................₩ doz $15.00—dis 40 %
Diagonal.............................₩ doz $24.00—dis 40 %
Angular...............................₩ doz $24.00—dis 40&5 %
Blind Adjusters.—Domestic..₩ doz $3.00—dis 30 %
Excelsior..................₩ doz $16.00—dis 50&10&2 %
Blind Fasteners.
Mackrell's.................. ₩ doz pairs, $1.00 dis 20&10 %
Van Sand's Screw Pattern..............$9 ₩ gro. dis 10&2 %
Van Sand's Old Pattern.................$9 ₩ gro dis 10&2 %
Washburn's Old Pattern.......................$9 ₩ gro. net
Merriman's...................................new list, net
Salisbury & Austin, No. 2008................$9 per gro. net
Security Gravity..............................$9 per gross. net
Blind Staples.
Bar bed, ⅜ in. and larger ....₩ ℔ 9¾c net
Bar bed ¾ in...₩ ℔ 11½c net
Blocks.
Penfield Block Co., I. R. and I. Strap'd... New List. dis 40 %
Penfield Block Co., W. I. C. bushed.... dis 40 %
Penfield Block Co., W. I. all steel roll'r.. dis 20 %
Penfield Block Co., L. & I Sheaves........ dis 20 %
Stanley Rule & Level Co.'s......................dis 40&10 %
Bolts.
Cast Iron Barrel Square, &c......................dis 55&10 %
Cast Iron Shutter Bolts...........................dis 60&10 %
Cast Iron Chain (Sargent's list)..................dis 65&10 %
Ives' Patent Door Bolts............................dis 55&10 %
Wrought Barrel..dis 55&10 %
Wrought Square.......................................dis 55&10 %
Wrought Shutter, all iron, Stanley's list....dis 50&10 %
Wrought Shutter, Brass Knob, Stanley's list.dis 50&10 %
Wrought Shutter, Sargent's list...............dis 55&10 %
Wrought Sunk Flush, Sargent's..................dis 75&10 %
Wrought Sunk Flush, Stanley's....................dis 40&10 %
Wrought B. K. Flush, Com'n Stanley's......dis 55&2½ %
Carriage and Tire Common.......dis 80&15 @ 80&20 %
Carriage and Tire, Philadelphia, new list..........dis 70 %
Carriage and Tire, Philadelphia Pattern............dis 70 %
R. B. & W. Carriage (old list)........................dis 70 %
Tire, Am. Screw Co.'s, Phila., new list, July 2 1883...dis 80 %
Tire, "Bay State," new list, July 2, 1883...........dis 65 %
Tire, R. B. & W., new list.........................dis 75&10 %
Stove—American Screw Co.'s..........................dis 45 %
Stove, R. B. & W.......................................dis 45 %
Stove, R. & E. Mfg. Co..................................dis 40 %
Plow...dis 50 %
Plow, R. B. & Co..dis 45 %
Machine..dis 65&10 %
Bolt Ends...dis 60&10 %
Borax...15½c ₩ ℔ net
Boring Machines. Upright Angular
First quality, no Augers...... $5.50 $6.75......dis 50 %
Phillips, with Augers.......... 7.00 7.50..........net
Jennings & Co., no Augers...... 5.50 6.75......dis 45 %
Saunders' Patent, Regular Bed, $6.00.................dis 20 %
Saunders' Patent, Extra Bed, $6.50....................dis 20 %
Braces.
Q. S. Backus...dis 50&5 %
Barber's..dis 40&5 %
Spofford's Patent.......................................dis 50&5 %
Ives' Patent Braces.................................dis 55@55&5 %
Common Ball (American)...................................dis 55 %
Amidon's..dis 20 %
Barker's Imp'd...dis 40 %
Empire..dis 30 %
Buffalo Ball..dis 40 %
Brackets.
Shelf, plain...dis 50&10 %
Shelf, fancy...dis 60&10 %
Reading, Plain..dis 55&5&10 %
Reading, Rosette.....................................dis 60&5&10 %
Bright Wire Goods.
List of June 25, '83.............................dis 70&10&— %
Bull Rings.
Union Nut Co...dis 55 %
Sargent's...dis 66⅔&10 %
Hotchkiss' low list...dis 15 %
Humason, Beckley & Co's.........................dis 66⅔&10 %
Peck, Stow & W. Co's..............................dis 33⅓ & 10 %
Butts.
Wrought Brass...dis 70@75 %
Cast Brass Tiebout's....................................dis 33⅓ %
Cast Brass, Corbin's Fast Joint.....................dis 20&10 %
Cast Brass, Loose Joint..............................dis 10&10 %
Fast Joint. Narrow ....dis 45&10&10 %
Fast Joint. Broad.....................................dis 45&10&10 %
Loose Joint...dis 55&10&10 %
Loose Joint, Japanned.................................dis 55&10&10 %
Loose Joint, Japanned with Acorns................dis 55&10&10 %
Parliament Butts.......................................dis 55&10&10 %
Mayer's Hinges..dis 60&10&10 %
Loose Pin, no Acorn ....dis 55&10&10 %
Loose Pin, Acorns..dis 55&10&10 %
Loose Pin, Acorns, Japanned......................dis 60&10&10 %
Loose Pin, Acorns, Japanned, Plated Tips.dis 60&10&10 %

WROUGHT IRON.

Fast Joint, Narrow......................................dis 50&10 %
Fast Joint, Lt. Narrow.................................dis 50&10 %
Fast Joint, Broad..dis 50&10 %
Loose Joint, Broad.....................................dis 55&10 %
Table Butts, Back Flaps, &c..........................dis 50&10 %
Inside Blind Regular....................................dis 50&10 %
Inside Blind, Light......................................dis 50&10 %
Loose Pin, Wrt..dis 55&10 %
Loose Pin, Light..dis 50&10 %
Spring Hinges:
Geer's Spring and Blank Butts.......................dis 25 %
Sabin Mfg. Co.'s Double Acting......................dis 35 %
Union Spiral Spring, Japanned.......................dis 25 %
Union Spring Hinge Co.'s................................dis 25 %
American Spring Hinge Co.'s...........................dis 30 %
Gem Spring Hinges..dis 30 %
Barker's Double Acting..................................dis 20 %
Union Mfg. Co...dis 25 %
Bommer's..dis 25 %
Buckman's...dis 25 %
Empire...dis 50&10 %
Acme..dis 65&10 %
Climax..dis 50&10 %
Blind Butts Parker......................................dis 70&2 %
Blind Butts, Palmer....................................dis 50&10 %
Blind Butts, Seymour...................................dis 70&2 %
Blind Butts, Lull & Porter..........................dis 75&10 %
Blind Butts, Nicholson................................dis 45&10 %
Blind Butts, Huffer.......................................dis 50 %
Blind Butts, Clark's, Nos. 1, 3, 5..................dis 70&2 %
Blind Butts, Sargent's, Nos. 1, 3..............dis 66⅔&10 %
Blind Butts, Sargent's, No. 12......................dis 70&10 %
Blind Butts, Reading's Gravity...................dis 66⅔&10 %
Blind Butts, Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55..dis 70 %
Blind Butts, Shepard's "Gravity," Nos. 1, 3 and 5...dis 70&10 %
Shepard's Lull & Porter Shutter Hinges....dis 70&10 %
Shepard's Reversible Shutter Hinges.......dis 70&10 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3..dis 60&10 %
Bow Pins.
Humason, Beckley & Co.'s, Nos. 1 and 2.........dis 60 %
Humason, Beckley & Co.'s other Nos......dis 66⅔&10 %
Sargent & Co.'s...........$19.70 and $21.40. dis 66⅔&10 %
Hotchkiss...dis 25 %
Peck, Stow & W. Co..dis 30&10 %
Butcher's Cleavers.
Humason & Beckley Mfg. Co............................dis 25 %
Bradley's..dis 25 %
Beatty's..dis 25&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

Calipers ....see Compasses
Can Openers.—Messenger's Comet, ₩ doz, $3.00 ....dis 25 %
American.............................₩ gross $6.00, dis 25@30 %
Duplex................................₩ doz 25c, dis 15@20 %
Lyman's.................................₩ doz $3.75, dis 20 %
No. 4, French.........................₩ doz $2.25, dis 55 %
No. 5, Iron Handle..................₩ gross $6.00, dis 25@30 %
Eureka...................................₩ doz $2.50, dis 10 %
Sardine Scissors.......................₩ doz $7.00, dis 55 %
Star.......................................₩ doz $5.00, dis 25&5 %
Sprague, No. 1, $2.00; No. 2, $2.25; No. 3, $2.50...dis 50&10 %
"Worlds Best" ₩ gross, No. 1. $12.00; No. 2, $24.00; No. 3, $30.00..dis 50 & 10 %
Universal...............................₩ doz $3.00, dis 35 %
Domestic...............................₩ doz $2.50, dis 45 %
Champion.............................₩ doz $2.00, dis 50 %
Caps—Percussion, ₩ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's.........................50c
E. B. Trimmed Edge, 1-10's.........................65c
E. B. Ground Edge, Central Fire, 1-10's..........70c
Double Waterproof, 1-10's.........................$1.10
Pistol Waterproof, 1-10's.........................75c
Musket Waterproof, 1-10's.........................80c — dis 10&10 %
G. D. & S. B.......................................33c, dis 10 %
U. M. C., F. C. trimmed............................50c
U. M. C., F. L. ground...............................70c — dis 15&10 %
U. M. C., Cen. fire ground...........................70c
U. M. C., Double W. Proof........................$1.40 — dis 10&5 %
Double Waterproof, in 1 10's.....................$1.40
Colt's Pistol, in 1-10's..................................75c — dis 10 %
F. L...50c
E. B. 1-10, trimmed...................................65c
E. B. 1-10, ground edge...............................70c — dis 10&5 %
Musket, in 1-10's...................................80c, dis 33⅓ %
Cartridges.—Rim.....................................dis 70 &5 %
Central Fire...dis 50 %
Cards.—Horse and Curry...............................dis 10 %
Cotton..................................new list, Aug., '83, dis 10 %
Wool.....................................new list, Aug., '83, dis 10 %
Carpet Stretchers.
Cast Steel, Polished....................₩ doz $5.00, dis 30 %
Cast Iron, Steel Points...............₩ doz $2.00, dis 50&5 %
Socket....................................₩ doz $2.50, dis 25 %
Bullard's ....dis 25 %
Casters.—Bed ....dis 45@50 %
Plate...45@50 %
Shallow Socket..dis 35&10 %
Deep Socket..dis 33⅓ %
Martin's Patent (Phœnix)......................................dis 25 %
Cattle Leaders.
Humason, Beckley & Co.'s.................................dis 70&10 %
Sargent's..dis 70&10 %
Hotchkiss...dis 25 %
Peck, Stow & W. Co.......................................dis 33⅓&10 %
Chain.
Trace, 6½-10-2........................₩ pair 79c
Trace, 6½-10-3........................₩ pair 70c — dis 35 %
Trace, 7-10-2..........................₩ pair 86c
German Halter Chain, list of Dec. 31, 1881.......dis 55 %
German Coil, list of Dec. 31, 1881....................dis 55 %
Covert Halter, Hitching and Breast.................dis 35&5 %
Oneida Halter Chain (old list)...........................dis 45 %
Galvanized Pump Chain...............................₩ ℔ 9½c net
Jack Chain, Iron...dis 60&10 %
Jack Chain, Brass...dis 50&10 %
Chalk.
White...₩ gross 60c net
Red..₩ gross 80c net
Blue...₩ gross $1.00 net
White Crayons..₩ gross 10c net
Chalk Lines.—See Lines.
Chisels.
Socket Framing, Crossman............................dis 65&10 %
Socket Framing, Arlington Edge Tool Co. / Socket Framing, Merrill / Socket Framing, Witherby Tool Co. / Socket Framing, Douglass' / Socket Firmers, Arlington Edge Tool Co. / Socket Firmers, Merrill / Socket Firmers, Witherby Tool Co. / Socket Firmers, Douglass' / Socket Corner — dis. 70 @ 70 & 10 %
Socket Framing and Firmer, Buck Bros ....dis 30 %
Tanged Firmers...dis 45 %
Tanged Firmers, Butcher's..................$5.00@$5.25 to £
Tanged Firmers, Spear & Jackson's..................5.00 to £
Tanged Firmers, Buck Bros (Shank)....................5.25 to £
Clamps.
Iron, Providence Tool Co.'s Wrt. Iron..................dis 25 %
Iron, Adjustable, Gray's.......................................dis 20 %
Iron, Adjustable, Lambert's..................................dis 20 %
Iron, Adjustable, Snow's.....................................dis 40&5 %
Iron, Adjustable, Hammer's..................................dis 15 %
Iron, Adjustable, Stearns'...................................dis 20&10 %
Iron, Cabinet, Sargent's......................................dis 70&10 %
Iron, Carriage Makers', Sargent's...............dis 65&10&10 %
Iron, Eberhard Mfg. Co.......................................dis. 33⅓ %
Saw Clamps..See Vises
Clips, Axle.
Norway or Best...dis 60&5 %
Superior..dis 60&5 %
Cockeyes...dis 55 %
Cocks, Brass.
Racking / Globe / Plain Bibbs / Ale and Beer — dis. ...55 %
Coffee Mills.
Board and Box..dis 50 %
Wilson's..dis 50 %
Selsor's Pat..............................$9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.).........................dis 20&10 %
The "Swift" (Lane Bros.).................................dis 20&10 %
Webb's Patent..dis 45@50 %
Compasses, Dividers, &c.
Compasses...dis 60 %
Calipers..dis 60 %
Dividers..dis 60 %
Bemis & Call Co.'s Dividers...............................dis 60&5 %
Bemis & Call Co.'s Compasses and Callipers..dis 50&5 %
Bemis & Call Co.'s Wing & inside or outside..dis 50&5 %
Bemis & Call Co.'s Double..................................dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)...............dis 30 %
Excelsior..dis 50 %
Cook's Extension..dis 25 %
J. Stevens & Co's Calipers and Dividers....dis 25& 10%
Coopers' Tools.
Bradley's...dis 10 @ 20 %
Barton's..dis 20 %
Corkscrews.—Humason & Beckly Mfg.Co.dis 33⅓ %
Clough's Pat..dis 33⅓ %
Corn Knives and Cutters.—Bradley's....dis 10 %
Wadsworths...dis 25 %
Crow Bars.
Cast Steel..₩ ℔ 6½c
Iron, Steel Points...₩ ℔ 5 c
Curling Irons, &c.
⅜, ⅝, ¾ in., $1.80, 2.00, 2.40............................ dis 10 %
Curling Tongs..................................₩ doz $3.65, dis 10 %
Pinching Irons.................................₩ doz $7.50, dis 20 %
Curry Combs.
Fitch's...dis 50&10 %
Hotchkiss, Novelty, new list, July 1880..............dis 25 %
Hotchkiss, Exclr. Supr. Champion ....dis 25 %
Rubber.......................................₩ doz $10.00, dis 25 %
Curtain Pins.
Silvered Glass..net
White Enamel..net
Cutlery.
Meriden Cutlery Co. (Table)....................................net
Am. Miller Bro.'s Cutlery Co............................dis 25 %
Humason & Beckley, Pocket..............................dis 33⅓ %
Naugatuck Cutlery Co ....list net
Aaron Purkinshaw's Pocket ....dis 25 %
Dividers...see Compasses
Dog Collars.—Embossed Gilt.......dis 30&10 %
Leather..dis 40 %
Brass..dis 40 %
Door Springs.
Torrey's Rod, regular size, ₩ doz., $3...............dis 50 %
Gray's Rod...........................per gross, $20.00, dis 15 %
Bee Rod..............................per gross, $20.00, dis 15 %
Warner's...dis 30 %
Gem (Coil):
No. 1, Large Japanned......₩ doz $4.00
No 2, Medium, Japanned...₩ doz 2.75 — dis 50 & 10 %
No. 3, Small, Japanned......₩ doz 2.00
Star (Coil)—For Cop'd, Nickel-Plated &c., see list.
No. 4 ("Shoo Fly") Screen door size, ₩ doz $1.50
No. 5, Screen Door size........... ₩ doz 2.00
No. 6, Medium........................₩ doz 2.75
No. 7, Large ....₩ doz 4.00 — dis 60 %
Sabin's Lever..No. 1, $1; 2, $1.50; 3, $2; 4, $2.50 .dis 35 %
Sabin's Boss. No. 1, ₩ doz. $4.00; 2 $2.75; 3, $2.dis 33⅓ %
Sabin's Crown..........................₩ doz $1.50. dis 33⅓ %
Philadelphia..................5 in., $5.00; 8 in., $7.75, dis 35 %
Cowell's......No. 1, ₩ doz. $18.00; No. 2, $15.00, dis 50 %
Rubber, complete..........................₩ doz. $2.25, dis 10 %
Hercules...dis 50 %
Drawing Knives.
Arlington Edge Tool Co.....................................dis 70 %
Crossman's No. 1...dis 65&10 %
Morrill..dis 70 %
Nobles Mfg. Co..dis 15 %
Bradley's...dis 35 %
Adjustable Handle..dis 20 %
Witherby Tool Co...dis 70 %
Douglass..dis 70 %
Drills and Drill Stocks.
Blacksmiths'...............................each, $2.50, dis 20 %
Blacksmiths' Self-Feeding................each, $7.50, dis 20 %
Breast, P. S. & W...dis 20&10 %
Breast, Hotchkiss'...dis 20 %
Breast, Wilson's...dis 25 %
Breast, Millers Falls ....each, $3.00, dis 25 %
Breast, Bartholomew's ....each, $2.50, dis 25&10 %
Ratchet, Merrill's...dis 20 %
Ratchet, Ingersoll's..dis 25 %
Ratchet, Whitney's...dis 20 %
Ratchet, Weston's..dis 20 %
Ratchet, Moore's Triple Action.........................dis 20&25 %
Whitney's Hand Drill, Plain, $11.00 Adjustable, $12.00...dis %
Wilson's Drill Stocks..dis 10 %
Automatic Boring Tools....................each, $7.25, dis 20 %
Drill Chucks.
Morse's Beach Patent...dis 30 %
Morse's Adjustable.......................each, $10.00, dis 30 %
Danbury..each, $8.00, dis 30 %
Egg Beaters.
Dover...₩ doz. $2.50, dis 2 %
Monroe's...dis 50 %
National..................................₩ doz. $4.50, dis 33⅓ %
Standard.................................₩ gross, $18.00, dis 25 %
Family (T. & S. Mfg. Co.).......................₩ gross, $18.00, net
Acme..₩ gross, $12.00, dis 25 %
Triumph (T. & S. Mfg. Co.).......................₩ gross, $11.50, net
Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in (Duc's Improved). ₩ 100, $15.00 @ $51.00..dis 10 %
Mill E. Buckets, heavy 5 to 10 in. (Duc's Improved), ₩ doz. $5.60 @ $10.20.....................................dis 10 %
Storehouse (Duc's Patent), 12 to 17, $12 @ $20....dis 10 %
Emery and Emery Paper.
Regular numbers..₩ ℔ 6c
Flour and F. F...₩ ℔ 4c
B. & A. Emery Paper..dis 30&5 %
Sibley's Emery and Crocus Cloth, large size, $16; medium, $10.50 ₩ ream..dis 15 %
Enameled and Tinned Ware.
Kettles...dis 50 %
Sauce Pans..dis 25 %
Tinned Sauce Pans..dis 25 %
Escutcheon Pins.
Brass...dis 50 %
Escutcheons.
Door Lock.................Same discounts as Door Locks
Brass Thread...dis 55 %
Wood..dis 25 %
Faucets.
Fenn's..dis 40 %
Bohren's Patent Rubber Ball................................dis 25 %
Fenn's Cork Stops..dis 33⅓ %
Star..dis 55&10 %
Frary's Patent Petroleum...................................dis 20&10 %
West's Patent Key ....dis 45 %
Anchor Lock..dis 45 %
Metallic Key, Leather Lined................................dis 60 %
Cork Lined...dis 70 %
J. Sommer's Best Metallic Key...........................dis 40&10 %
J. Sommer's Cork Lined, 1st quality........................dis 50 %
Self-Measuring, Enterprise....₩ doz. $36.00, dis 20&10 %
Self-Measuring, Lane's..........₩ doz. 36.00, dis 20&10 %
Self-Measuring, Victor.........₩ doz. $36.00, dis 25&10 %
Felloe Plates............................₩ ℔, 10c, dis 25 %
Files.
J. & Riley Carr...................new list April 1, '83, dis 15 %
J & Riley Carr Horse Rasps.................................dis 10%
Butcher's..
Moss & Gamble.....................................new list, dis 15 %
H. Disston & Sons...dis 40 %
Nicholson...dis 40 %
New American..dis 40 %
Union File Co...dis 40 %
Heller Bros.' Files...dis 40 %
Heller Bros.' Horse Rasps..................................dis 30&10 %
Western..dis 40 %
Stubs.......................................new list, dis 25@30 %
Fluting Machines.
Knox, 4½-inch Rolls..................$3.50 each
Knox, 6-inch Rolls......................$4.00 each — dis 35 %
Eagle 3½ inch Roll.............................$2.15, dis 35 %
Eagle, 5½-inch Roll..............................2.85, dis 35 %
Crown, 4½-in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel.......................6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter....................................$1.50 each, net
Geneva Hand Fluter, White Metal...₩ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00 ₩ doz...dis 30 %
Shepard Hand Fluter, No. 85.......per doz $15, dis 40 %
Shepard Hand Fluter, No. 110.....per doz $8.75, dis 30 %
Shepard Hand Fluter, No. 95 .....per doz $6.50, dis 20 %
Clark's Hand Fluter.....................₩ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron....₩ doz $15.00, dis 30 %
Buffalo.......................................₩ doz $10.00, dis 10 %
Fluting Scissors...dis 45 %
Fly Traps.
Paragon...₩ doz, $3. net
Forks.
Hay, Manure and Spading.......................................dis 50 %
Plated, A 1, Rogers & Bro...............................dis 40&10&5 %
Plated, Reed & Barton....................................dis 40&10&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co..dis 20&10 %
Fry Pans.
Burnished list as follows...............................dis 60&10&5 %

No.........	0	1	2	3	4	5	6	7	8
₩ doz.....	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

"Acme"..dis 40&10 %
Gauges.
Marking Stanley's...dis 50&10 %
Marking, Chapin's..dis 55&10 %
Wire..dis 70&10 %
Wire, Disston's..dis 20 %
Wire, Wheeler, Madden & Co ....dis 10 %
Gimlets.
Nail and Spike. ....dis 40&10 %
"Eureka" Gimlets..dis 40&10 %
"Diamond" Gimlets..dis 40&10 %
Double Cut, Shepardson's..................................dis 40&10 %
Double Cut, Hartwell's.......................................dis 40&10 %
Double Cut, Ives'..dis 40&10 %
Double Cut, Douglass'...dis 40 %
"Bee"...₩ gro. $12.00, dis 25 %
Glue Pots.
Tinned and Enameled ....dis 33⅓ %
Family, Howe's "Eureka"......................................dis 25 %
Family, L. F. & C.'s "Handy"...............................dis 30&10 %
Grindstone Fixtures.
Sargents Patent..dis 70&10 %
Reading Hardware Co..dis 30&10 %
Gun Wads.
U. M. C. B. E., 11 up..........................$2.00
U. M. C. B. E., 9&10.............................2.30
U. M. C. B. E., 7&8...............................2.60
U. M. C. P. E., 11 up.............................3.10
U. M. C. P. E., 9&10..............................4.00
U. M. C. P. E., 7&8................................4.90 — dis 5&5 %
Halters.
Covert's Pat. Rope...dis 50 %
Covert's Horse and Cattle Ties...................................dis 50 %
Union Pat. Rope and Web....................................dis 40&10 %
Union Horse and Cattle Ties ....dis 40&10 %
Hammers.
Maydole's...dis 15 %
Cheney's, new list, March, 1883 ....dis 20&5 %
Hartford Hammer Co. (new list July 1, '81) ....dis 20 %
Humason & Beckley...dis 15 %
Verree...dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.26, 1.50 and 1.75.dis 25&10 %
Nelson Tool Works..dis 40&10 %
Warner & Noble's...dis 10 %
Yerkes & Plumb..dis 30 %
Wilkinson's Smiths'....................................11½c ₩ ℔ net
Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ₩ doz.dis 10 %
Providence Tool Co., Leg Irons, $25.00 ₩ doz....dis 10 %
Tower's..dis 25 %
Handles.—Door or Thumb Latches.

Nos.	0	1	2	3	4	
Per doz....	$0.80	1.00	1.18	1.35	1.50	....dis 60&10 %

Roggin's Latches. ....₩ doz 35c. @ 40c. net
Bronze Iron Drop Latches.............₩ doz $0.80 @ 0.90 net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88...net
Barn Door.................................₩ doz $1.60, dis 10&10 %
Wrought Chest...dis 70 %
Surface Chest ....dis 60&10 %
Flush Chest..dis 70 %
Lifting...dis 60&10 %
Saw and Plane...dis 40&10 %
Boynton's Loop Saw Handles.......................50c. dis 50 %
Boynton's Centennial Saw Handles..............30c. dis 25 %
Hammer and Hatchet...dis 20 %
Brad Awl.......................................₩ gross, $2.50 dis 10 %
Hickory Firmer Chisel, assorted, ₩ gross . $4.50
Hickory Firmer Chisel, large, ₩ gross 5.00
Apple Firmer Chisel, assorted, ₩ gross..... 5.00
Apple Firmer Chisel, large, ₩ gross......... 6.00
Socket Firmer Chisel, assorted, ₩ gross.... 3.00
Socket Framing Chisel, assorted, ₩ gross.. 5.00
File assorted. ₩ gross.............................. 2.75
Auger, assorted, ₩ gross........................... 5.00
Auger, large, ₩ gross............................... 7.00 — dis 20&10 @ 25&10
Patent Auger, Ives'..dis 20&10 %
Patent Auger, Douglass'..........................₩ set $1.25 net
Patent Auger, Swan's...............................₩ set $1.00 net
Hangers.
Barn Door, old patterns ....dis 60&10 %
Barn Door, New England....................................dis 65&10 %
Climax (Anti-Friction)...dis 50 %
Challenge..dis 50 %
"Champion" Medina Mfg. Co...................$15; dis 50&10 %
Sterling Improved (Anti Friction)........................dis 65&10 %
Cheritree..dis 50 %
Kidder's..dis 50&5 %
U. S...................................4 in., $12; 5 in., $15; dis 60 %
The "Boss"..dis 50&10 %
Terry's Patent..........................5 in., $12; 3½ in., $10; dis 40 %
Cronk......No. 4, $12; No. 5, $14 40; No. 6, $21; dis 50
Harness Snaps.
Anchor (T. & S. Mfg. Co.)...................................dis 60@65 %
Henshaw's, list of 1½ changed to $14.00,.....dis 60@65 %
Judd's, list of 1½ changed to $14.00............dis 60 @ 65 %
Fitch's (Bristol), list of 1½ change to $14.00.dis 60 @ 65 %
Hotchkiss'...dis 10 %
Andrews'..dis 40 %
Sargent's...dis 70&10 %
German, low list, Sep., 1882.................................dis 33⅓ %
German, Sargent's new list..............................dis 60&10 %
Covert..dis 50 %
Covered Spring, new list, Oct., 1882 ....dis 60&10 %
Union...dis 50&10 %
Union Improved German.................................dis 60&10 %
Hatchets.
Isaiah Blood...dis 30 @ 35 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 3	₩ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	₩ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	₩ doz	7.50	8.00	8.50

Hunt's..dis 25 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 3	₩ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	₩ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	₩ doz	7.30	8.25	9.00

Hurd's...dis 30 @ 35 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 3	₩ doz	$8.00	$8.50	$9.00
Claw,	Nos. 1 2 3	₩ doz	9.00	9.50	10.00
Lathing,	Nos. 1 2 3	₩ doz	8.00	8.50	9.00

Yerkes & Plumb..dis 30 @ 35 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 2	₩ doz	$7.50	$8.00	$8.50
Claw,	Nos. 1 2 3	₩ doz	8.25	8.75	9.25
Lathing,	Nos. 1 2 3	₩ doz	7.50	8.00	8.50

Simmons'...dis 30 @ 35 %

	Nos.					
Shingling,	Nos. 0 1 2 3	₩ doz	$7.50	$8.00	$8.50	$9.00
Claw,	Nos. 0 1 2 3	₩ doz	....	8.50	9.00	9.50
Lathing,	Nos. 0 1 2 3	₩ doz	....	8.00	8.50	9.00
Broad,	Nos. 1 2 3 4	₩ doz	9.00	10.00	12.00	14.00
Broad,	Nos. 5 6 7 8	₩ doz	16.00	18.00	20.00	22.00

Collins...dis 10 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 3	₩ doz	$5.50	$6.00	$6.50
Claw,	Nos. 1 2 3	₩ doz	6.00	6.50	7.00
Lathing,	Nos. 1 2 3	₩ doz	5.50	6.00	6.50

Peck's Champion Blade.......................................dis 30 @ 35 %

	Nos.		1	2	3
Shingling,	Nos. 1 2 3	₩ doz	$8.00	$8.50	$9.00
Lath,	Nos. 1 2 3	₩ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	₩ doz	9.00	9.50	10.00
Half,	Nos. 1 2 3	₩ doz	8.00	8.50	9.00
Ax Pattern,	Nos. 1 2 3	₩ doz	10.00	11.00	12.00

Hay Knives.
"Lightning".......................................₩ doz $20.00 dis 10 %
Wadsworth's...dis 33⅓ %
Hinges.
Gate, Western. ....₩ doz $4.90 dis 55 %
Gate, N. E..₩ doz $7.70, dis 55 %
Gate, N. E. Reversible ....₩ doz $5.75, dis 55 %
Gate, Clark's, Nos. 1 2 3...dis 55 %
Gate, N. Y. State...................................₩ doz $5.05, dis 55 %
Gate, Automatic....................................₩ doz $12.50, dis 50 %
Gate, Common Sense.......................₩ doz pair $4.50, dis 50 %
Gate, Seymour's...dis 45&10 %
Gate, Shepard's...........Nos. 1, 2, 3, 10, 20 & 25, dis 50&10 %
Rolled Blind Hinges..dis 60&10 %
Rolled Plate...dis 60&10 %
Rolled Raised...dis 60&10 %
Plate Hinges "Providence" — 8, 10 & 12 in., $5.55 ₩ 100 ℔; over 12 in., $4.50 ₩ 100 ℔ ..dis 10 %
Screw Hook and Strap — 8, 10, 12 in., $7.00 ₩ 100 ℔; 14 to 36 in. $5.75 ₩ 100 ℔ ..dis 10 %
Heavy Welded Hook — 8 to 12 in., $7.00 ₩ 100 ℔; 14 in & up, $5.50 ₩ 100 ℔ — dis 10 %
Screw Hook and Eye — ⅝ & 1 in. 9c; ¾ in., 9c; ⅜ in., 10c; ½ in., 12c — dis 20 %
Wrought Strap and T ....dis 60&10&2 % @ ——
Hoes.
Riveted Shank...........................₩ doz $5.00, dis 50 %
Socket....................................₩ doz $5.25, dis 50 %
Planters'..dis 50 %
Scovill Pattern...dis 50 %
Handled Planters'..dis 50%
Magic...₩ doz $5 net
Grub...₩ doz $11, dis 50 %
Hooks.
Bird Cage, Sargent's list...................................dis 60&10 %
Bird Cage, Reading ....dis 40&10 %
Cotton.....................................₩ doz $4.00, dis 50 %
Cotton Patented (N. Y. Mallet & Handle W'ks), dis 30 %
Cotton (Humason & Beckley Mfg. Co)......................dis 40 %
Belt...dis 60&10
Bench—Hotchkiss' $5.50 ₩ doz.................................dis 10 %
Weston's. No. 1, $10.00; No. 2, $9.00 ₩ doz..dis 25&10 %
McGill's, $3.00 ₩ doz...dis 10 %
Clothes Line, Sargent's list.................................dis 65&10 %
Clothes line, Reading list.................................dis 45&5&10 %
Ceiling, Sargent's list..................................dis 60&10&10 %
Harness, Reading list.....................................dis 40&10&10 %
Coat and Hat, Sargent's list...........................dis 60&10&10 %
Coat and Hat, Reading.................................dis 40&10&10 %
Wire Coat and Hat, Gem......................................dis 40&10 %
Wire Coat and Hat, Miles'..dis 70 %
Picture Hooks, Brown's Pat. Solid Brass, $4.00 ₩ gross...dis 25 %
Tassel and Picture (T. & S. Mfg. Co.)............................dis 50 %
Wrought Staples and Hooks & Staples..dis 70&7½&10 %
Wrought Staples, Stanley's list.....................dis 70&7½&10 %
Wire Screw Hooks and Eyes...new list, dis 70&10&— %
Grass and Bush..dis 45@50 %
Whiffletree—Patent...dis 40 %
Hooks and Eyes—Malleable Iron..........................dis 60&10 %
Hooks and Eyes—Brass......................................dis 60&10%
Horse Nails.

	Nos. 5	6	7	8	9	10	
Ausable, ₩ ℔	31c	28c	26c	25c	24c	23c	dis 30&10 %
Clinton, Plain, ₩ ℔	23c	21c	20c	19c	18c		dis 30&10 %
Clinton, Fin., ₩ ℔	24c	22c	21c	20c	19c		dis 30&10 %
Essex, ₩ ℔	31c	28c	26c	25c	24c	23c	dis 30&10 %
Putnam "	27c	24c	22c	21c	20c	19c	dis 5&7 %
Vulcan, "	26c	23c	21c	20c	19c	18c	dis 12½ %
Globe, "	24c	21c	19c	18c	17c	16c	dis 12½ %
A. C., "	26c	23c	21c	20c	19c	18c	dis 10&10 %
Ch'mpl'in Forged "	31c	28c	26c	25c	24c	23c	dis 30 %
New Haven, "	31c	28c	26c	25c	24c	23c	dis 30&10 %
Bridgewater, "	24c	21c	19c	18c	17c	16c	dis
Saranac, "	26c	23c	21c	20c	19c	18c	dis 25 %

Horse Shoes.—Burden.................................₩ keg $4.37½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy..........................₩ keg $4.37½
Walker's Forged, Light, Med. or Heavy .₩ keg $4.37½
Mule Shoes...₩ keg $5.37½
Dunning's Steel..₩ keg $9.25
Ice Awls, Chisels, &c.
American Ice Chisel...............................₩ doz $3.00 net
National Ice Chisel...........................₩ doz $6.25 dis 20 %
Novelty Ice Breakers ....₩ doz. $6.25 dis 20 %
White's Sliding Head Picks...................₩ doz $2.50 dis 40 %
Dunlap's Ring Picks...........................₩ doz $2.00 dis 20 %
Wood Head Picks, Sargent's.......₩ doz $1.60 dis 50&10 %
Iron Head Picks, Sargent's.........₩ doz $1.25 dis 50&10 %
Ice Mallets, Pick in head.................₩ doz $1.75 dis 15 %
Ice Mallets, Pick in Handle..............₩ doz $2.00 dis 15 %
Ice Axes, Small Cast or Malleable..₩ doz $1.20 dis 10 %
Combination Ice Tools............................₩ doz $2.00 net
Ice Cream Freezers.
Amn. Mch. Co...dis 40 %
Torrey's...dis 40 %
Packer's...dis 40 %
Ice Creepers.
Safety Reversible.......................₩ gross $25
Arctic Solid...............................₩ gross $30 — dis 10 %
Ice Tongs.
Champion................................₩ doz $6.00 dis 25&10 %
Family.......................................₩ doz $2.75 dis 15 %
Kettles.
Brass, 7 to 13 inches inclusive.......................₩ ℔ 28c net
Brass larger than 13 inches...............................₩ ℔ 32c net
Knives.—Ames' Butcher Knives ....dis 20 %
Ames' Shoe Knives...dis 15 %
Ames' Bread Knives.................................₩ doz $1.50 dis 15 %
Moran's Shoe and Bread Knives....................................dis 20 %
Hay and Straw, Wadsworth's..dis 33⅓
Table and Pocket..See Cutlery
Knobs.
Carriage (Jap'd 80c ₩ gross)..................................dis 60&10 %
Base—Common ....dis 30&10 %
Hemacite Door Knobs ....new list, dis 35&5 %
Door Mineral / Door Por. Jap'd / Door Por. Plated / Door Por. — Same discounts as Door Locks.
Furniture Plain..............................75c gross inch, dis 10 %
Furniture, Wood Screws...dis 20 %
Picture, Judd's...dis 60&10&10 %
Picture, Sargent's..dis 60&10 %
Hemacite, Picture...dis 35 %
Shutter, Porcelain..dis 60&10 %
Ladles.
Melting, Sargent's...dis 50&10 %
Melting, Reading..dis 30&10 %
Melting, Monroe's Patent.....................₩ doz $4.00 dis 40 %
Melting, P. S. & W...dis 30&10 %
Lanterns.
Tubular.................................No. 0, $7.50; No. 1, $9.00 With Guards, 40c extra — net
Nail City..No. 1 ₩ doz $10; No. 2, $9, net
Meteor.....................................No. 1, ₩ doz, $9.50; No. 2 $8.50, net
Hurricane, No. 2...₩ doz $5.75, net
Peerless, No. 5................................₩ doz $11.75, dis 10&10 %
Brady's Patent...dis 10&10 %
Ætna...dis 10&20 %
Yankee...dis 10&10 %
De Beque...dis 10 %
Police Small, $6.25; Med., $7.50; ....net
Convex Reflector ....%
Lawn Mowers.
Excelsior and Clipper..
Pennsylvania...dis 50 %
Philadelphia..dis 20 %
Lemon Squeezers.
Porcelain Lined ....₩ doz $6.00, dis 30 %
Wood...₩ doz 3.00, dis 30 %
Eureka, Tinned......................................doz 8.00, dis 10 %
Dunlap's Improved..................................₩ doz 2.75, dis 20 %
Sammis'...No. 1, $5; 2, $8.40; 12, $15 ₩ doz; dis 25&10 %
Townsend's Patent.........................$6.00 ₩ doz, dis 33⅓ %
Jennings "Star" ....$2.00 ₩ doz net
The "Boss"..₩ doz $4.00, dis 10&10 %
Dean's Nos. 1, ₩ doz, $15.00; 2, $9.00; 3, $5.00.dis 40&10 %
Lines.—Linen Fish...dis 25&10 %
Cotton Chalk..dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gross..dis 20 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50..net
Masons' Colored Cotton...dis 45 %
Wire Clothes, Galvanized.............................each 25c@40c net
Locks and Latches.
Cabinet, Eagle / Cabinet, Gaylord / Cabinet, Bridgeport — Changes made in list price of some numbers Jan. 1, 1881, dis 40 %
Cabinet, P. & F. Corbin...dis
Cabinet, A. E. Deitz...dis 30 @ 40 %
Cabinet, Stoddard Lock Co...dis 40&5 %
Trunk, new list, Jan. 1, 1881..dis 15&2 %
Langstroth & Crane's List, Jan. 1, '77 .
Round Key, Nos. 1 to 5...dis 40&10 %
Round Key, Nos. 5½ to 12....................................dis 40&10 %
Flat Key...dis 33⅓&10 %
A. E. Deitz, Flat Key..dis 30@40 %
Yale Lock Co., Flat Key...dis 40 %
"Shepardson" or "U. S."..dis 35 %
"Felter" or "American"..dis 33⅓ %
Plate..dis 33⅓&2 %
F. Many's "Extension Cylinder"......$10.50 ₩ doz net
Barnes Mfg. Co..dis 40 %

DOOR LOCKS, ETC.

Branford / Norwalk / Norwich / P. & F. Corbin / Russell & Erwin / Mallory, Wheeler & Co. / Whipple Mfg. Co. — Circular Prices. Revised list of June 11, 1883, dis 50 % and 2 % for cash.
Reading Hardware Co. (low list)..............................dis 40&2 %
Padlocks—Russell & Erwin / Mallory, Wheeler & Co. / Norwich Lock Mfg. Co. / Wm. Wilcox & Co. — dis 30&10 % and 2 % for cash
Yale Lock Mfg. Co.'s "Standard".................................dis 40 %
Romer's..dis 25 @ 40 %
Conestoga..dis 60 %
Scandinavian (Moore Bros.)...dis 80 %
J. H. McWilliams...dis 10 %
A. E. Dietz...dis 25 %
"Star"...dis 45 %
Fraim & Bro. (new list)..dis 50&10 %
Barnes Mfg. Co...dis 40 %
Lustro.—2-oz. bottles, ₩ doz $1.75 ₩ gross $17.00 net
Mallets.—Hickory...dis 10&10 %
Lignumvitæ..dis 10&10 %
Penfield Block Co., Lignumvitæ & Hickory ..dis 30 %
Meat Cutters.
Dixon's (P.S.&W.) Nos. 1 2 3 4 — ₩ doz..$14.00 17.00 19.00 30.00—dis 25&5 %
Miles' Challenge..........Nos. 1 2 3 — ₩ doz..$22.00 30.00 40.00—dis 40 %
Perry's. Nos. 1 2 3 4 4 g'rd 5 g'rd — Each...$3.00 4.00 5.00 11.00 13.00 36.00—dis 25&5 %
Woodruff's (P. S. & W.)......Nos. 100 150 — ₩ doz..$15.00 18.00—dis 25&5 %
Hales'..............Nos. 11 12 13 — ₩ doz..$27.00 33.00 45.00—dis 50&10&2 %
Draw Cut..Nos. 5 2 6 8 10 — Each..$50.00 75.00 80.00 225.00 100.00—dis 2 %
American...dis 20&10 %

Nos........	1	2	3	4	B
Each.......	$5.00	7.00	10.00	25.00	50.00	60.00

Enterprise...dis 25 %

Nos.	10	12	22	2	
Each	$3.00	2.50	4.00	6.00	10.00

Kieser's No. 55..$40 ₩ doz dis 40 %
Kieser's Gem...$25 ₩ doz, dis 40 %
Kieser's Monarch..$45 ₩ doz, dis 40 %
Kieser's Butcher...$40 each, dis 20 %
Silver & Deming..dis 25 %
Pennsylvania..dis 40&10 %

Nos	1	2	3	00
₩ doz	$24.00	28.00	36.00	28.00

Beef Shavers (Enterprise Mfg Co.) ....dis 20&10 %
Mincing Knives.
Am. (2d quality), ₩ gross, 1 blade, $7 2 blades, $12 3 blades, $18...net
Lothrop's...dis 20&10 %
Smith's, ₩ doz, Single, $2.25; Double, $3...dis 33⅓&10 %
Cowles Hdw. Co...dis 55 %
Molasses Gates.
Stebbins Patterns...dis 70&10 %
Stebbins Genuine...dis 67½&10 %
Stebbins Tinned Ends...dis 40&10 %
Chase's Hard Metal..dis 50&10 %
Bush's..dis 20 %
Lincoln's Pattern...dis 60&10 %
Weed's..dis 15 %

Boss Nos.	1	2	3	4	
	$7.00	8.00	9.00	10.00	₩ doz. dis 60&10&10 %

Nails....See Trade Report
Nuts and Washers...(In lots less than 100 ℔ ₩ ℔ add ½c to list; 1 lb. boxes, add 1c to list.)
Square Nuts...8 c off list
Hexagon Nuts...8½c off list
Washers ....7½c off list
Nut Crackers.
Table (Humason & Beckley Mfg. Co.)..........................dis 33⅓ %
Blake's Pattern.......................................₩ doz $2.00, dis 5 %
Turner & Seymour Mfg. Co..dis 50 %
Oakum.—Is on 100 bales and over ⅛ % ₩ ℔.
Best...₩ ℔ 9 c
U. S. Navy..₩ ℔ 8 c
Navy...₩ ℔ 6¾c
Oilers.—Zinc and Tin ....dis 60 %
Brass and Copper..dis 50 %
Malleable (Hammer's)...............................₩ doz. $5.00, dis 10 %
Prior's Patent or "Paragon" Zinc ....dis 60 %
Prior's Patent or "Paragon" Brass................................dis 50 %
Olmstead's, Tin and Zinc..dis 60 %
Olmstead's, Brass and Copper ....dis 50 %
Broughton's, Zinc..dis 60 %
Broughton's, Brass..dis 50 %
Packing, Steam.
N. Y. Belting and Packing Co. ....dis 20 %
Pencils.
Faber's Carpenters'...high list, dis 50 %
Faber's Round Gilt...₩ gross $5.25, net
Dixon's Lead..₩ gross $4.50, net
Dixon's Lumber..₩ gross $6.75, net
Dixon's Carpenters'..dis 40&10 %
Picks.
Railroad, 5 to 6, $11.00 · 6 to 7, $12.00...............................dis 50 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00..............................dis 50 %
Picture Nails.
Brass Head, Sargent's list ....dis 50&10 %
Brass Head, T. & S. Mfg. Co...dis 50 %
Porcelain Head, Sargent's list.....................................dis 50&10 %
Porcelain Head, Judd's list ....dis 40@40&10 %
Porcelain Head, T. & S. Mfg. Co ....dis 40 %
Niles' Patent...dis 33⅓ %
Pinking Irons...₩ doz 75c, net
Plaiting Machines.
Magic...₩ doz $10.00, net
Astor Plaiting Machine...................................each $15.00, dis 20 %
Crown Plaiting Machines...dis 25 %
6 in., $6.50; 10 in., $8.00 each.
Planes and Plane Irons.
Bench, First Quality...dis 20 %
Bench, Second Quality..dis 25 %
Molding...dis 15 %
Bailey's (Stanley R. & L.Co.) new list, Jan.'79.dis 20&10 %
The Stanley (S. R. & L. Co.) new list, Jan.'79..dis 20&10 %
Bailey's "Victor"...dis 20&10 %
Defiance Adjustable...dis 20&10 %
Laflin Mfg. Co...dis 35 %
Plane Irons, Butcher's..$5.00 @ $5.25 to £
Plane Irons, Buck Bros..$5.00 to £
Plane Irons, Auburn Tool Co..dis 20 & 10 %
Plane Irons, The Globe Mfg. Co., "Baldwin Iron"..dis 20& 10 %
Plane Iron, Ohio Tool Co...dis 20&10 %
Plane Irons, Sandusky Tool Co...dis 20&10 %
Pliers and Nippers.
Button's Patent..dis 33⅓ %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz............................dis 25 %
Humason & Beckley Mfg. Co.....................................dis 30&10 %
Gas Pliers...dis 55 %
Eureka Pliers and Nippers...dis 40 %
Russell's Parallel...dis 25 %
P. S. & W. Cast Steel...dis 33⅓&10 %
P. S. & W. Tinners' Cutting Nippers...add 6 % dis 10 %
Plumbs and Levels.
Disston's...dis 30 %
Stanley R. & L. Co.'s Pat. Adjustable........................dis 65&10 %
Stanley R. & L. Co.'s Non-Adjustable.........................dis 65&10 %
Chapin's Patent Adjustable...................................dis 65&10&10 %
Chapin's Non Adjustable......................................dis 65&10&10 %
Standard Rule Co.'s New Adjustable..........................dis 65&10 %
Standard Rule Co.'s Non-Adjustable..........................dis 65&10 %
Johnson's Patent Adjustable.....................................dis 65&10 %
Pocket Levels..dis 65&10 %
Davis' Inclinometers...dis 20 %
Post Hole and Tree Augers.
Samson Post Hole Digger..........₩ doz $37.50, dis 20 %
Fletcher Post Hole Augers.............₩ doz $30.00, dis 20 %
Vaughan's Post Hole—
6 in., $23.00; 7, 8 and 9 in., $25.00 ₩ doz ....dis 20&10 %
Eureka Diggers ₩ doz $27.00...net
Leed's each $2.50...net
Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw, ₩ doz $19.00, dis 20 %
Disston's Pruning Hook..................₩ doz $12.50, dis 20 %
E. S. Lee & Co.'s Pruner...dis 33⅓ %
Pruning Shears..................................₩ doz $5.50 @ 6.00
Wheeler, M. & Co.'s Combination.......₩ doz $12, dis 20 %
Dunlap's Saw and Chisel...................₩ doz $5.00, dis 30 %
Pulleys.
Hot House and Tackle..dis 65&10 %
Jap'd Screw..dis 65&10 %
Brass Screw...dis 70&10 %
Jap'd Side...dis 65&10 %
Jap'd Clothes Line..dis 60&10 %
Hay Fork, Solid Eye.....$1.50; Swivel, $2.00, dis 50&10 %
Hay Fork, "Anti Friction"......................$0.75, dis 10&10 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron.......................................dis 20 %
Shade Rack ....dis 45 %
Punches.
Belt or Drive.................................₩ doz $2.00; 2.25 2.50, dis 50 %
Bemis & Call Co.'s Cast Steel Drive..............................dis 50&5 %
Bemis & Call Co.'s Springfield Socket.........................dis 50&5 %

Spring ..... ₱ doz $7.00, dis 50&7½ %
Spring, Leach's Patent ..... dis 15 %
Remis & Call Co.'s Spring and Check ..... dis 40 %
Solid Tinners' ..... ₱ doz $1.44, dis 40 %

Rail.
Sliding Door, Wrought Brass. ₱ ℔ 43c, dis 33⅓ %
Sliding Door, Bronzed Wrt. Iron.... ₱ foot 12c, dis 33⅓ %
Sliding Door Iron, Painted..... ₱ foot 4c, dis 10&10 %
Barn Door....Inch ..... ½ ⅝ ¾
Per 100 feet $2.60 3.60 5.60—dis 10 %
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet..... $2.10 2.70 .30—net
Terry's Wrought Iron, 50c ₱ foot. ..... net

Hangers.
J. R. Torrey Razor Co. ..... dis 15 %

Razor Strops.
Genuine Emerson..... dis 48 %
Badger's (not Emerson)..... dis 33⅓ %
Imitation Emerson..... ₱ doz $2.00, dis 20 %
Hunt's ..... dis 40&5 %
Chapman..... dis 15 & 2 %
Saunder's..... dis 10 %
Torrey's..... dis 20

Rivets.
Iron and Tinned, new list, Dec. 10, 1881. ..... dis 40 %
In bulk, new list, Dec. 10, 1881..... dis 10 %
Copper Rivets and Burrs ..... dis 50 %
Nos.. 7 8 9 10 11 12 13 14 15
₱ ℔. 49c 50c 52c 54c 56c 58c 60c 65c 70c

Rivet Sets. ..... dis 33⅓&10 %

Rods.
Stair, Brass ..... dis 25 %
Stair Black Walnut ..... 60c. ₱ doz. dis 10

Rollers.
Barn Door, Sargent's list..... dis 5c&10&10 %
Acme (Anti-Friction)..... dis 50 %

Rope.
Mnfs' List, August 3, 1883..... dis 1c ₱ ℔
Manila..... ½ inch and larger ₱ ℔ 15½c
Manila..... ⅜ inch ₱ ℔ 16 c
Manila..... ¼ and 5-16 inch ₱ ℔ 16½c
Manila, Tar'd Rope..... ₱ ℔ 15 c
Manila, Tar'd Lath Yarn..... ₱ ℔ 15 c
Manila, Hay Rope..... ₱ ℔ 15½c
Sisal..... ½ inch and larger ₱ ℔ 10½c
Sisal..... ⅜ inch ₱ ℔ 11 c
Sisal..... ¼ and 5-16 inch ₱ ℔ 11½c
Sisal, Hay Rope ..... ₱ ℔ 10c 4c

Rules. Boxwood. Ivory.
Chapin's } dis 70&10 % } dis 45&55 %
Standard }
Stanley..... dis 70&10 %..... dis 55%
Stephens.....

Sad Irons.
From 4 to 10..... ₱ ℔ 3¼c net
Self-Heating ..... ₱ doz $9.00 ! et
Self Heating, Tailors' ..... ₱ doz $18.00 ! et
Gleason's Shield and Toilet..... dis 25 %
Mrs. Pott's Irons, Doubled Pointed..... dis 35 %
Mrs. Pott's Irons, Square Back..... dis 35 %
Enterprise Star Irons, new list, July 20, 1882.... dis 35 %
Combined Fluter and Sad Iron... ₱ doz $15.00, dis 15 %
Chinese Tailor dry (N. E. Butt Co.)..... 8½c, dis 15 %
New England..... 6c dis 25 %

Sand Paper.
Baeder & Adamson's Flint, 00 to 1½ $4.50 ₱ ream
Baeder & Adamson's Flint, 2, 2½ & 3. 5.00 ₱ ream
Baeder & Adamson's Flint, Assorted. 4.75 ₱ ream
Baeder & Adamson's Star..... 3.75 ₱ ream
Baeder & Adamson's Emery.. ₱ ream $6.50 @ 11.50
Barties Flint..... $4.75&$6.25 ₱ ream dis 35 %
Bartles Harrison, $4.75 ₱ ream..... dis 35 %
New England same list as B. & A. Flint..... dis 35 %
Gage's ..... dis 30&5 %

Sash Cord.
Common..... ₱ ℔ 13c net
Patent..... ₱ ℔ 15c net
Silver Lake, Hemp..... ₱ ℔ 50c, dis 10&5 %
Silver Lake, White Cotton..... ₱ ℔ 50c, dis 10&5 %
Silver Lake, Drab Cotton..... ₱ ℔ 55c, dis 10&5 %
Raw Hide, ₱ foot, ¼ in., 5c.; 5-16 in., 7c.; ⅜ in., 10c. ..... dis 15 %
Steel Ribbon..... dis 10 %

Sash Locks.
Clark's, No 1, $10.00; No. 2, $8.00 per gross.... dis 33⅓ %
Ferguson's..... dis 33⅓ %
Walker's..... net
Hammond's Window Springs..... dis 25 %
Northup Window Springs, No. 1, $10.00 ₱ gross..dis 15 %
"Common Sense," Japanned, Coppered and Bronzed. ..... ₱ gross $5.00 net
Common Sense," Nickel Plated.. ₱ gross $10 00 net
Universal"..... dis 30 %

Sash Weights.
Solid Eyes. In 500 ℔ lots and over..... ₱ ℔ 1¾c net

Sausage Stuffers or Fillers.
Miles "Challenge"..... ₱ doz $20, dis 20 %
Perry..... ₱ doz. No. 1½; No. 0, $21, dis 25&10 %
Draw Cut No. 4..... each $30.00, dis. 20 %
Enterprise Mfg. Co..... dis 25 %
Oliver's..... dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut..... dis 40 %
Disston's Hand, Panel, Rip, &c..... dis 20 %
Boynton's Lightning Cross Cuts, new list..... dis 40 %
Boynton's Circular and Mill..... dis 40 %
Boynton's Ice..... dis 25 %
Boynton's Lightning Hand, Panel and Rip..... dis 25 %
Wheeler & Clemson Mfg. Co.'s Hand..... dis 30 %
W. M. & C. Mfg. Co. Cross Cuts..... dis 30 %
Livingston's Butcher and Kitchen..... dis 20 %
Livingston's Framed Wood—
Nos 101 102 103 104 105
Per doz.....$10.00 8.40 10.00 7.40 6.20 net
Peace Circular and Mill..... dis 40 %
Peace Hand, Panel and Rip..... dis 25 %
Peace Cross Cuts..... dis 35 %
Peace Band Saws, all widths..... dis 10 %
Richardson's Circular ..... dis 40 %
Richardson's Mill and X Cut..... dis 40 %
Richardson's Hand Panel, Butcher and Web Saws..... dis 25 %

Saw Frames.
White, Vermont ..... ₱ doz $1.50, dis 25&10%
Red, Polished and Varnished..... ₱ doz $1.50, dis 10%
Saw Rods..... $10 list, dis10 & 10%

Saw Sets.
Boynton's Patent X Cut, per doz, $12.00; Hand Saw per doz, $10.00..... dis 25 %
Stillman's Genuine..... ₱ doz $3.50 and $5.50 dis 10 %
Stillman's Imitation..... ₱ doz $3.25, dis 30&10 %
Common Lever..... ₱ doz $2.00, dis 30&10 %
Leach's..... No 0. $8.00; No. 1, $15.00, dis 15 %
Nash's..... dis 20&10 %
Hammer, Hotchkiss..... $5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent.... dis 30&5 %
Bemis & Call Co.'s Lever & Spring Hammer.. dis 30&5 %
Bemis & Call Co.'s Plate..... dis 10 %
Bemis & Call Co.'s Cross Cut..... dis 12½ %
Aiken's Genuine..... $13.00, dis 50&10 %
Aiken's Imitation..... $8.00, dis 55 %
Hart's Patent Lever..... dis 20 %
Disston's ..... dis 20 %
Morrill's..... No. 1, $15 No. 0, $12, dis 40&5 %

Scales.
Hatch, Counter, No. 171..... ₱ doz $42, dis 45 %
Hatch, Tea, No 161. ..... ₱ doz $15.00, dis 45 %
Union Platform..... $6.00, dis 45 %
Fairbanks'..... dis 25 %
Richlé Bros ..... dis 20 & 10 %
Buffalo Scale Co..... dis 20&10 %
Forsyth Scale Co..... dis 20&10 %
Howe's ..... dis 20&10 %
Chatillon's Grocers'..... dis 30 %
Chatillon's Eureka..... dis 25 %
Family Universal, 12 ℔., $30; 24 ℔ $36..... net
Family Favorite..... dis 30 %
Family, Turnbull's..... dis 30 %
Scale Beams, List of January 12, 1882..... dis 40&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.) $6.50, dis 20&10 %
Box 1 Handle... ₱ doz $4.00, dis 10 %
Box Handle..... ₱ doz $6.00, dis 10 %
Defiance Box and Ship..... dis 20&10 %
Foot ..... dis 50&10 %
Ship, common..... ₱ doz $3.50 net
Ship, Providence Tool Co.... dis 10 %

Screen Corners.
Porter's Pat Windowand Door Frame..... dis 33⅓

Screw Drivers.
Douglas Mfg. Co..... dis 20&10&10 %
Disston's..... dis 20 %
Disston's Patent Excelsior..... dis 40 %
Buck Bros ..... dis 25 %
Stanley Rule & Level Co.'s, Varnished Hdls..dis 60&10 %
Stanley Rule & Level Co.'s, Black Handles...dis 50&10 %
Sargent & Co.'s..... dis 50&10 %
Gay's Double Action Ratchet ₱ doz. 4 in., $9.00; 5 in., $10.20; 6 in., $12.00—dis 35 %
Mallett & Co.'s Double Action Clutch ₱ doz., 4 in., $7.00; 5 in., $8.00; 6 in., $9.00—dis 15 %
Champion..... dis 25 %
Clark's Patent..... dis 25 %

Screws.
Flat H'd Iron, new list, Dec 27, 1882..... dis 55 %
Round Head Iron, new list, Dec. 27, 1882..... dis 55 %
Flat Head Brass, new list Dec. 27, 1882..... dis 55 %
Round Head Brass, new list, Dec. 27, 1882..... dis 45 %
Brass and Silver Capped..... dis 40 %
Japanned, list of Plain Screws..... dis 20&10 %
Dosen, Patent Gimlet Point ..... dis 70 %
Bed..... dis 10&60
Machine, Flat Head, Iron..... dis 55 %
Machine, Round Head, Iron..... dis 60 %
Bench, Iron..... dis 55&10 %
Bench, Wood, Beech..... ₱ doz $3.00, dis 10 %
Bench, Wood, Hickory..... dis 20&10 %
Hand, Wood..... dis 25&10 %
Hand Rail, Sargent's..... dis 60%&10 %
Hand Rail, Humason, Beckley & Co.'s.... dis 60%&10 %
Hand Rail, Am. Screw Co., list of Jan. 1, '81..... dis 70 %
Jack (Wilson's)..... dis 20 %

Screw Window Balances.
R. R. Huguniu's, No. 1, $2.10; No. 2, $1.75; No. 3 $1.00 ..... ₱ doz net

Scroll Saws.
Lester, $15.00. ..... dis 25 %
Rogers, $5.00. ..... dis 25 %

Shears and Scissors.
American (Cast) Iron..... dis 70&70&10 %
Pruning..... see Pruning Hooks and Shears.
Barnard's Lamp Trimmers..... ₱ doz $5.75
Tinners' ..... add 5 %, dis 10 %
Seymour's, List, Dec., 1881..... dis 60 %
Heinsch's, List, Dec., 1881..... dis 60 %
Heinsch's Tailor's Shears..... dis 33⅓ %
Mass. Cutlery Co. St. Trimmers..... dis 75 %
Cast Steel Trimmers..... dis 50 %
Wiss, J., & Sons list, Dec., 1881..... dis 60 %
Wiss, J., & Sons' Tailors' Shears..... dis 40 %

Sheaves.
Sliding Door, M. W. & Co. list..... dis 5 & 10&2 %
Sliding Door, R. & E. list..... dis 50&10&2 %
Sliding Door, Patent Roller ..... dis 50&10&2 %
Sliding Door, Patent Roller, Hatfield's.... dis 50&10&2 %
Sliding Door, Russell's Anti Friction..... dis 50&10&2 %
Sliding Door, Moore's Anti Friction..... dis 50 %
Sliding Shutter R. & E. list..... dis 40&10&2 %
Sliding Shutter, Sargent's list..... dis 60&10 %
Sliding Shutter, Reading list..... dis 60&10 %
Moore's Anti-Friction (Hanging)..... dis 50 %

Shovels and Spades.
James, New list, July 1, 1883 ..... dis 15 %
Griffiths ..... dis 50&5 %
Old Colony..... dis 15 %
Payne Pettebone & Son, new list..... dis 40&10 %
Payne Pettebone & Son, R. R. Shovels..... dis 15 %
Remington's (Lowman's Patent)..... dis 30 %
Rowland's ..... dis 50&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list..... dis 60&10&2 %
Iron and Brass Head, P. S. & W..... dis 60&10&10 %
Polished Steel, new list... ..... dis 50&10&2 %

Slates.
Square Frames, by case..... dis 70 %
Less than a case..... dis 60&10 %

Spoke Shaves.
Defiance Metallic..... dis 20&10 %
Iron..... dis 45 %
Wood..... dis 30 %
Bailey's (Stanley R. & L. Co.), new list.... dis 30&10 %
Stearns'..... dis 30&10 %

Spoke Trimmers.
Bonney's..... ₱ doz $10.00, dis 40&5 %
Stearns'..... ₱ doz $9.00, dis 20&10 %
Ives'..... No. 1, $15.00; No. 2, $12.00 ₱ doz, dis 55&10 %
Douglass'..... ₱ doz $9.00, dis 15 %

Spoons.
Basting..... dis 60&10 %
Solid Table and Tea..... dis 60 %
Britannia..... dis 60&10 %
Reed & Barton..... dis 40&10&5 %
Holmes, Booth & Haydens..... dis 40&10&5 %
German Silver..... dis 30&10&5 %
Cast Steel, Silver Plated..... dis 33⅓ %
Tin (P. S. & W.), Teas..... $1.25 ₱ gross, net
Tin (P. S. & W.), Tables..... $2.00 ₱ gross, net
Tin (Cowles Hdw. Co.)..... dis 10 %
Tin (Cowles Hdw Co.), case lots..... dis 20 %

Stocks and Dies.
"Lightning" Screw Plate..... dis 10 %

Stone.
Hindostan No. 1, 60; Axe, 80..... dis 40 %
Sand Stone..... ₱ ℔ 8c, dis 33⅓&10 %
Washita Stone..... No. 1, ₱ ℔ 18c net
Washita Stone..... No. 2, ₱ ℔ 16c net
Washita Stone, Slips..... No. 1, ₱ ℔ 37c net
Arkansas Stone No. 1, 4 to 6 in..... ₱ ℔ $1.35 dis 10 %
Arkansas Stone No. 1, 6 to 9 in..... ₱ ℔ $2.00 dis 10 %
Turkey Oil Stone (Chase)....4 to 8 in., ₱ ℔, 60c, dis 10 %
Turkey Slips (Chase)..... $1.75 ₱ ℔ dis 10 %
Lake Superior (Chase)..... ₱ ℔ 16c, dis 10 %
Lake Superior, Slips (Chase)..... ₱ ℔ 30c, dis 10 %
Grindstones, Family, Loring's..... dis 10 %

Stove Polish.
Joseph Dixon's..... ₱ gross $6.00, dis 10 %
Gem..... ₱ gross $4.50, dis 10 %
Gold Medal..... ₱ gross $6.00, dis 25 %
"Mirror"..... ₱ gross $6.00, dis 5 %
Lustro..... ₱ gross $4.75, net
Ruby..... ₱ gross $3.75, net
Rising Sun..... ₱ gross $6.75, net
Dixon's Plumbago..... ₱ ℔ 8c, net
Lyon's Noon Day ₱ gross No. 1, large, $6.50 No 2, small, $5 No. 3, medium, $4.

Squares.
Steel and Iron..... dis 60&10&2 %
Nickel Plated..... dis 60&10&2 %
Try Square and T Bevels..... dis 50&10 %
Disston's Try Square and T Bevels..... dis 40 %
Winterbottom's Try and Mitre..... dis 20&10 %

Tacks, Brads, &c.
New List, Sept. 1, 1882.
Tinned Swedes Tacks ..... dis 30 %
Tinned American Tacks..... dis 30 %
Swedes Tacks, all kinds..... dis 30 %
American Cut Tacks..... dis 30 %
Copper Tacks and Nails..... dis 30 %
Swedes Hungarian Nails..... dis 35 %
Gimp and Lace Tacks..... dis 30 %
Gimp and Lace Tacks, Tinned..... dis 30 %
Finishing Nails..... dis 25 %
Trunk and Clout Nails..... dis 25 %
Common and Patent Brads..... dis 25 %
Basket Nails..... dis 20 %
Brush Tacks ..... dis 20 %
Leathered Carpet Tacks..... dis 20 %
Cigar Box Nails..... dis 20 %
Chair Nails..... dis 20 %
Double-pointed Tacks..... dis 40& 5%
Extra 10 % on all.

Tap Borers.
Common and Ring..... dis 20 %
Ives' Tap Borers..... dis 15&10 %
Enterprise Mfg. Co..... dis 20&10 %

Tapes, Measuring.
American..... dis 25 %
Spring..... dis 25&10 %
Chesterman's..... regular list dis 15 %

Thermometers.
Tin Case..... dis 80 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion) ..... dis 20&10 %
Wood Bottom..... ₱ doz $10.00, dis 25&10 %
All Iron..... ₱ doz $8.25, dis 15 %
Nashua Lock Co.'s..... ₱ doz $18.00 dis 50&15 %
Wilson's..... dis 50 %
Clipper (Sargent & Co.)..... ₱ doz $18.00. dis 20 & 10 %

Toe Calks.
Winsted..... ₱ ℔ 9c, dis 5

Tinners' Tools and Machines.
Machines (P. S. & W.)..... list add 20 % } dis 10 %
Tools (P. S. & W.)..... add 6 % }

Transom Lifters.
Wollensak's Patent..... dis 35 %
Reiher's Patent, new list, Feb., 1883..... dis 20&10&10 %
Excelsior..... dis 50&10&2 %

Traps.
Game, Newhouse ..... dis 35 %
Game, Oneida Pattern..... dis 60 %
Game, Blake's Patent..... dis 40&5 %
Mouse, Wood, Choker..... ₱ doz holes, 15c
Mouse, Round Wire..... ₱ doz $1.60, dis 10 %
Mouse Cage, Wire ..... ₱ doz $2.50, dis 10 %
Mouse, Catch-em-alive..... ₱ doz $2.50, dis 15 %
Mouse, "Bonanza"..... per gross $10.00 net
Rat, "Decoy"..... ₱ doz $10.00, dis 10 %

Trowels.
Lothrops' Brick and Plastering..... dis 25 %
Reed's Brick and Plastering ..... dis 15 %
Disston's Brick and Plastering..... dis 20 %
Peace's Plastering..... dis 25 %
Clement & Maynard's..... dis 20 %
Rose's Brick..... dis 15 %
Brades' Brick ..... dis 25 %
Worrall's Brick and Plastering..... dis 20 %
Garden..... dis 55 %

Trucks (Warehouse, &c.
Penfield Block Co.'s list, 1882..... dis 40 %

Vises.
Solid Box..... dis 35 %
Solid, Peter Wright's..... 15&60
Solid, Wilkinson's..... 120&150
Parallel, Parker's..... dis 30 %
Parallel, Wilson's..... dis 50 %
Parallel, Howard's..... dis 20&10 %
Parallel, Merrill's..... dis 15 @ 20 %
Parallel, Sargent's..... dis 50&10 %
Parallel, Backus and Union..... dis 60 %
Parallel, Double Screw Leg..... dis 15&10 %
Parallel, Prentiss..... dis 25 %
Parallel, Simpson's Adjustable..... dis 25&5 %
" Family," List..... net
Saw Filers, Bonney's..... ₱ doz $24.00, dis 20&10 %
Saw Filers, Stearn's..... dis 20&10 %
Saw Filers, Hopkins'..... ₱ doz $17.50, dis 10 %
Saw Filers, Reading..... dis 20&10 %
Cowell Hand Vises..... dis 20 %
Richardson's Vise and Anvil..... dis 25 %

Washer Cutters.
Smith's Patent..... ₱ doz $12.00, dis 25 %
Johnson's..... ₱ doz $11.00, dis 33⅓ %
Penny's ..... ₱ doz Pol. $17.50; Jap'd, $16.50. dis %
Appleton's..... ₱ doz $16.00, dis 60&10 %

Washers.—See Nuts and Washers.

Well Wheels. ..... dis 60&10 %

Window Balances.
Huguuin Improved Pat. Screw, new list..... dis 40 %

Wire.
Brass and Copper..... dis 33⅓ %
Market, Bright an Annealed .. .. dis 55 @ 57½ %
Market, Coppered..... dis 50 @ 52½ %
Market, Galvanized..... dis 45 @ 47½ %
Market, Tinned, Tinned list..... dis 47½ @ 50 %
Stone, Bright and Annealed Nos. 0 to 18 .dis 57½ @ 60 %
Stone, Bright and Annealed Nos. 19 to 26 ..dis 60 @ 65 %
Stone, Bright and Annealed Nos. 27 to 30.dis 62½ @ 70 %
Stone, Galvanized Nos. 19 to 30 ..... dis 45 @ 5.. %
Stone, Tinned, Tinned list..... dis 45 @ 47½ 0
Tinned Broom Wire..... dis 57½ @ 60 %
Cast Steel Wire..... dis 47½ @ 50 %
Annealed Fence, Nos. 8 & 9..... dis 57½ @ 60 %
Annealed Grape, Nos. 10 to 14..... dis 57½ @ 60 %
Fence Staples..... ₱ ℔ 4¼ @ 5½c
Fence Staples, Galvanized..... ₱ ℔ 6¼ @ 6½c
Stubs Steel Wire..... $5.00 to £ dis 30 %
Japanned Barb Fence..... ₱ ℔ 6½c @ —
Galvanized Barb Fence..... ₱ ℔ 7½c @ —
Steel Music Wire, Nos. 7 to 30..... $1.50 ₱ ℔
Picture Wire, T. S. & J..... dis 40 %
Clothes Line Wire, Galvanized..... ₱ coil 25 @ 40c net
Wire Cloth, green, drab and black, ₱ sq. ft., 20c. @ 24c ..... net

Wrenches.
American Adjustable..... dis 45 %
Baxter's Adjustable "S,"..... dis 20&5 %
Baxter's Diagonal..... dis 5&5 %
Coes' Genuine..... dis 50&5 %
Coes "Mechanics"..... dis 50&10&2 %
Coes' Pattern, Malleable..... dis 75 %
Coes' Pattern Wrought ..... dis 70 %
Girard Standard..... dis 60 %
Girard Agl..... dis 70 %
Bemis & Call's Patent Combination..... dis 20 %
Bemis & Call's Merrick 'sPattern..... dis 35 %
Bemis & Call's Brigg's Pattern..... dis 25 %
Bemis & Call's Cylinder or Gas Pipe..... dis 40 %
Aiken Pocket (Bright)..... $6.00, dis 50&10 %
The Favorite Pocket (Bright)..... ₱ doz $4. dis 40 %
Webster's Patent Combination..... dis 25 %
Taylor's Farmers'..... dis 25 %

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Universal, XX, No. 1½..... 51.00
Universal, XX, No. 1..... 96.00
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Peerless, with Cogs, No. 2½..... 45.00
Peerless, with Cogs, No. 2..... 46.00
Peerless, with Cogs, No. 3..... 54.00
Peerless, with Cogs, No. 4..... 96.00
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Novelty Nu for Common Tubs..... $42.00
Novelty, that for Common Tubs..... $48.00
Excels decide futu, tationary Tubs..... $51.00
Excel decide futu, tationary Tubs..... $47.00
Excelsion, &c. There ding Bench..... $50.00
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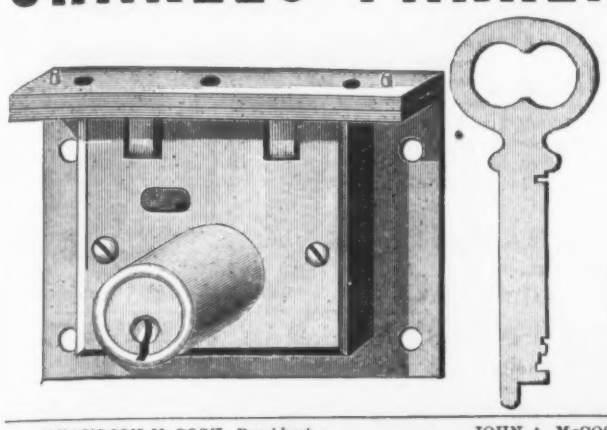

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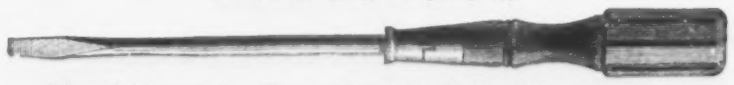

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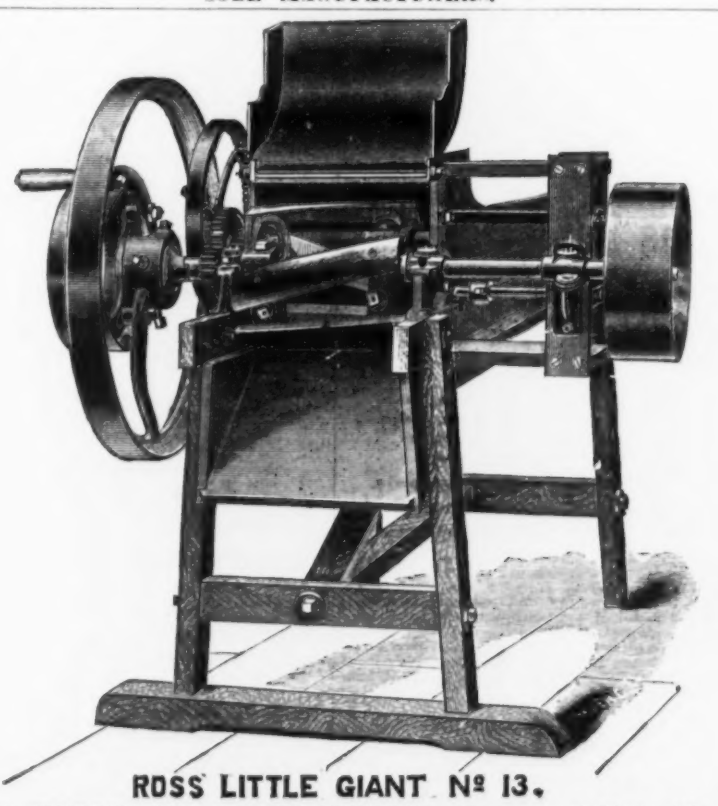

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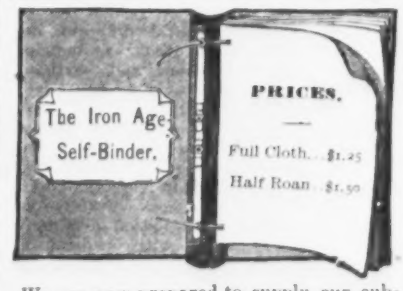

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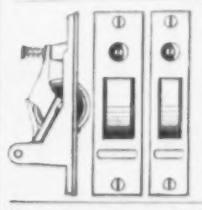

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Volcanic Disturbances in Java.

Seismology is one of the youngest of sciences, but its progress is not likely to be hindered from lack of material. Scarcely have we recovered from the shock of the Ischia calamity when news of a similar catastrophe reaches us from the other side of the world. Java is celebrated for its volcanoes, just as Japan, further north, is notorious for its earthquakes—so notorious that an irritable seismologist has called it "the lid of Hell." Every one who has journeyed to the far East is familiar with Anjer Point, on the northwest coast of Java, as one of the welcome places of call where a stock of fresh vegetables and fruit can be laid in. Opposite this, in Sanda Strait, lies the volcanic island of Krakatoa, the eruption of which has led to what is feared may be a sweeping disaster. Java, with its 16 active, and innumerable quiescent, volcanoes, is used to eruptions, some of which have been even more destructive than the Ischia earthquake. This volcano of Krakatoa has been in a state of unusual activity for some weeks, and had it not been for the "tidal wave," its activity might have subsided without doing material damage. Some of the Java volcanoes rise to a hight of 12,000 feet, and in past time their eruptions have been enormously destructive. In 1772, for example, the volcano of Papandayang, in the southwest part of the island, threw out such an immense quantity of scoriæ and ashes in a single night, that an area having a radius of seven miles was covered with a layer 50 feet thick. Forty native villages were buried beneath it, and 3000 persons are supposed to have perished in this one night. Still more terribly destructive was the eruption of Mount Galunggong, a few miles east of the former, on October 8, 1822. At midday, under a cloudless sky, with not a breath stirring, a dark, dense mass rose from the old volcano and spread itself out with such appalling rapidity that in a few moments the whole landscape was shrouded in the darkness of night. Bright flashes occasionally pierced the darkness; a deluge of hot water and mud shot up from the crater and poured down the mountain sides, sweeping away trees and beasts and human bodies in its seething mass. Nearly everything was destroyed for a radius of 20 miles round. A second eruption four days after completed the catastrophe. This was accompanied by an earthquake; the summit of the mountain was broken down; one side, covered with forest, became a semicircular gulf; new hills and valleys are said to have been formed, and rivers had their courses changed. As many as 114 villages were destroyed, and 4000 people killed. The remarkable thing is that no record existed of any previous eruption of the mountain, which was situated in one of the most fertile valleys of Java. In 1843 it is estimated that Mount Guntuo flung forth ashes and sand to the extent of 20,000,000 tons; in 1867 an earthquake caused the death of 1000 people in the town of Jokgokarta alone; in 1872 one of the most active volcanoes, Merapi, brought death to many of the dwellers around; while the damage to be feared from the ashes thrown out by the same mountain interferes with the planting of coffee in the neighboring districts. Earthquakes destructive to life are of frequent occurrence; the most celebrated is that of January 5, 1699, when 208 shocks were felt, and many houses in Batavia destroyed. Mud volcanoes, gas fountains and hot springs are common over the island. From Java to Kamschatka seismical phenomena in the shape of volcanoes and earthquakes are of constant occurence, though the accompanying tidal wave is not so common as we find it on the other side of the Pacific or the coast of South America.

There seems little doubt that the so-called "tidal wave" which has swept over the coast of Java is intimately connected with the volcanic activity of the mountain in the bay. This kind of wave is of a totally different character and origin from the last destructive wave that visited that quarter of the world—the cyclone wave of Bengal, on October 31, 1876, which, sweeping up the Bay of Bengal to the low-lying country around the mouth of the Ganges, covered an area of 3000 square miles, and in a few minutes destroyed 215,000 lives. The wave which has swept over Java has quite a different origin, though what is the exact connection between such phenomena and earthquakes and volcanic action seismologists have not yet determined. The last great manifestation of the kind was on June 10, 1877, when an enormous wave spread itself from the Sandwich Islands to the Peruvian coast, and even made itself felt in Australia and New Zealand. This wave was certainly coincident with a violent eruption of Mount Kilauea, in Hawaii, and with frequent earthquake shocks and eruptions on the west coast of South America. Both in the Sandwich Islands and in Peru the wave repeatedly charged over the land, carrying ships far inland and destroying everything that came in its way. Curiously enough, on the same date a very marked shock of earthquake was felt at Comrie, in Scotland, the most frequent center of seismic activity in that country. But this earthquake wave was not nearly so destructive to life as that which in 1868 destroyed the towns of Arica and Arequipa, in Peru, when 30,000 lives were lost. There seems little doubt, then, that the so-called tidal wave which has swept over the west coast of Java is really of seismic origin, and is akin to those earthquake waves which have been so destructive elsewhere. But what is the exact relation between the activity of Krakatoa volcano and wave cannot as yet be determined.

The ancient art of fusing metals for the production of artistic articles, which flourished at Venice at the time of the Renaissance, has been revived with great success. Thirteen factories, says Vice-Consul de Zuccato, are now reproducing, after ancient models, artistic bronzes, candelabra, plates, armor, swords, etchings, chiseled works, &c., for which there is a considerable demand, which is not confined to Itally.

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And Index to Advertisements.

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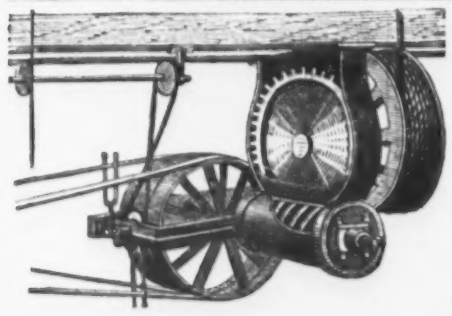

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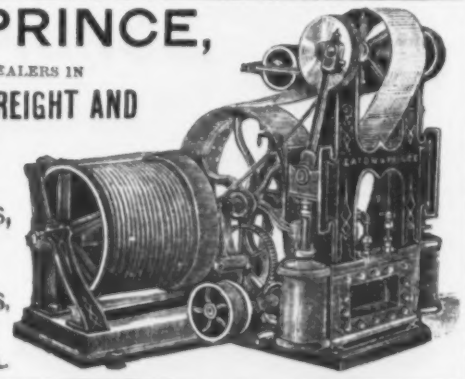

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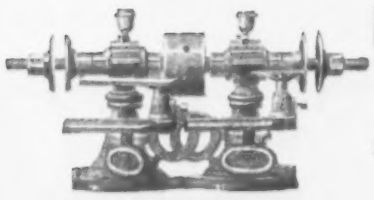

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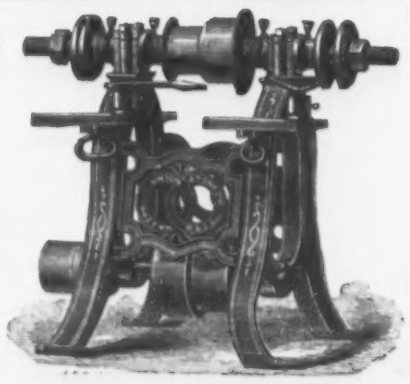

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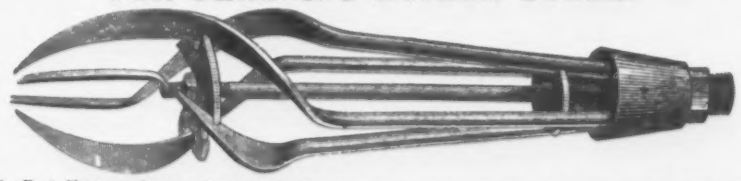

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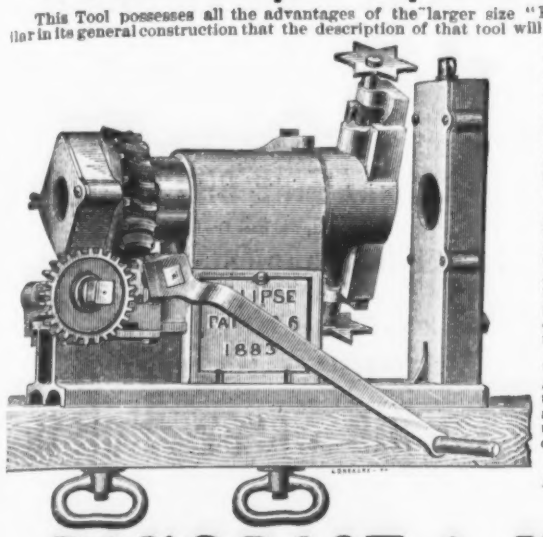
This Tool possesses all the advantages of the larger size "Eclipse" Machine, and is so similar in its general construction that the description of that tool will serve for the "Junior" also. It meets the requirements of those who have use for a Screwing Machine light enough to be readily carried about, sufficiently powerful in its gearing (18 to 1) to work easily, and strong enough to bear rough usage. All of these points, with the very important one of MODERATE COST, are to be found in the **"Junior" Eclipse Machine.**



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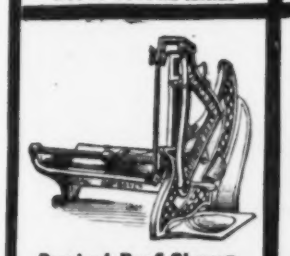

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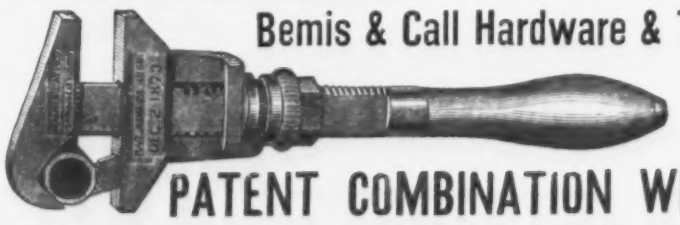

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These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a combination which has no equal.

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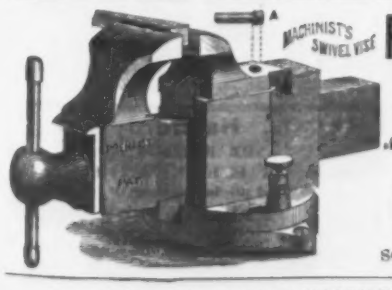

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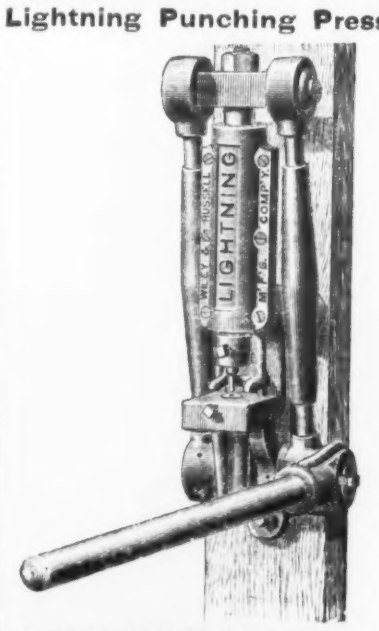

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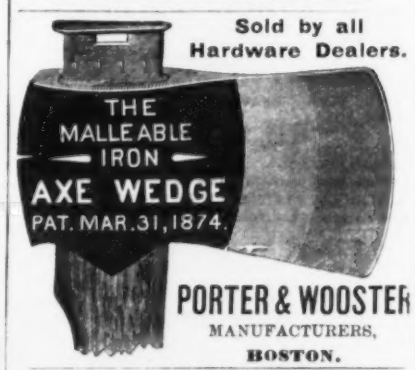

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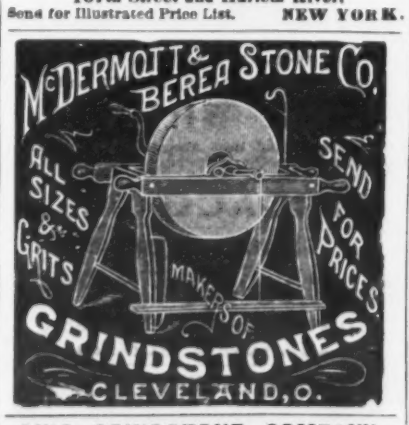

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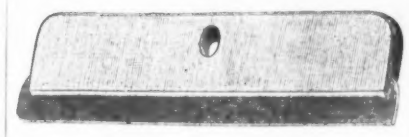

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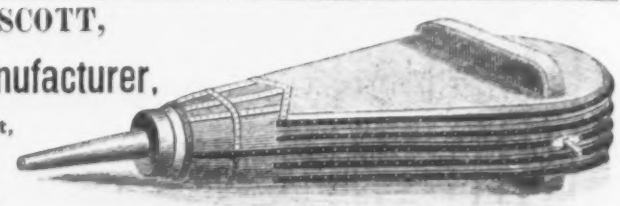

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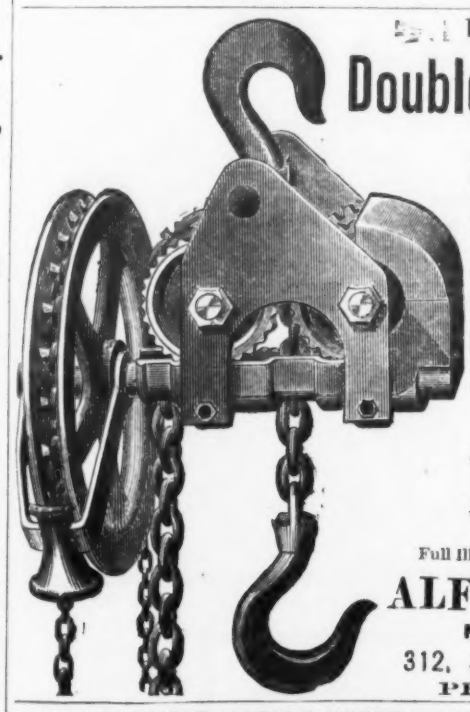

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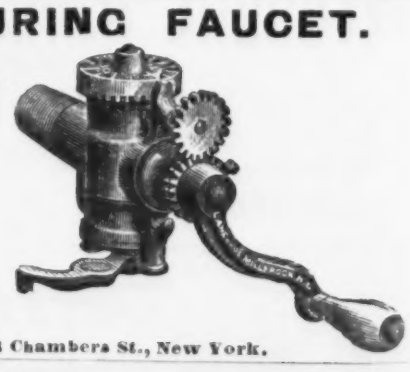

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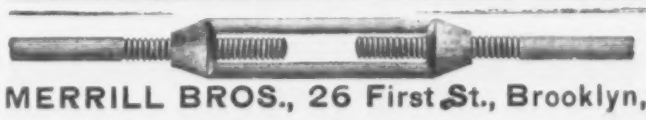

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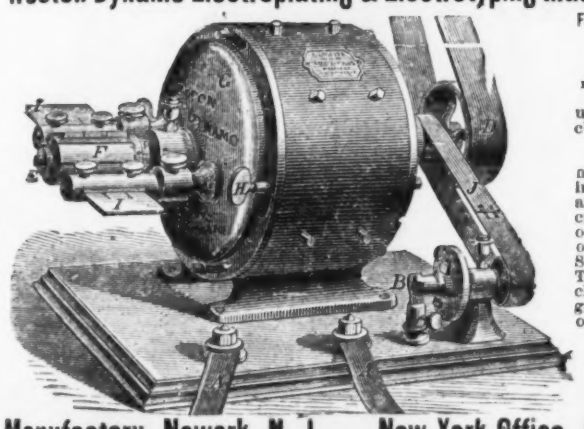

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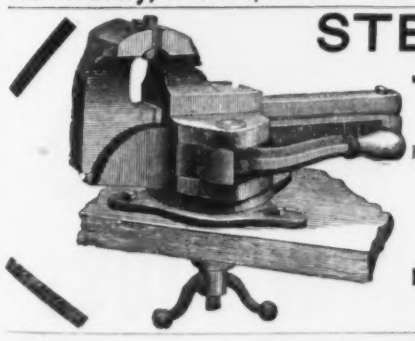

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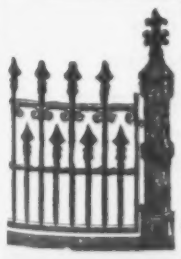

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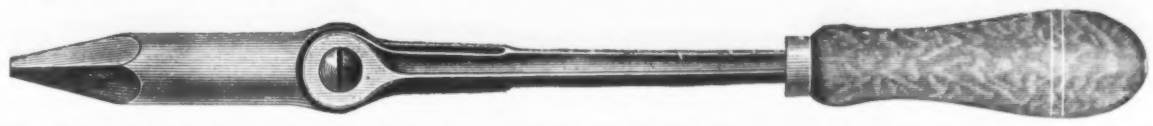

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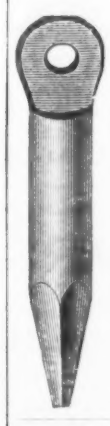

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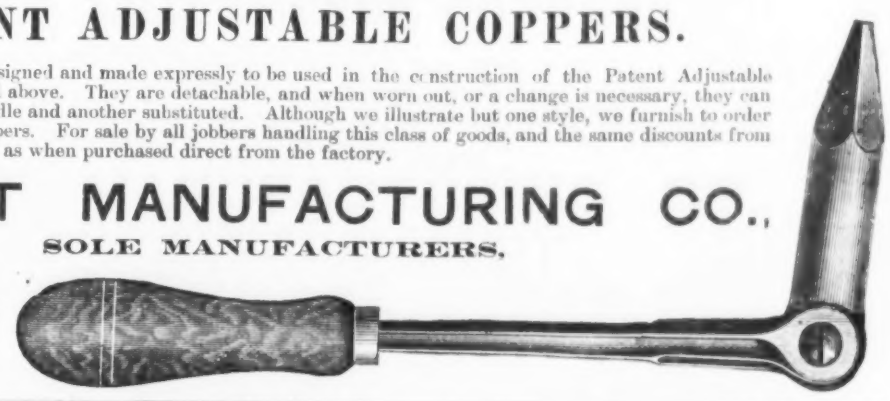

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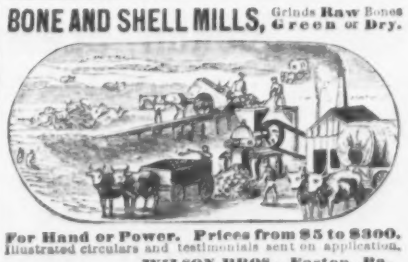

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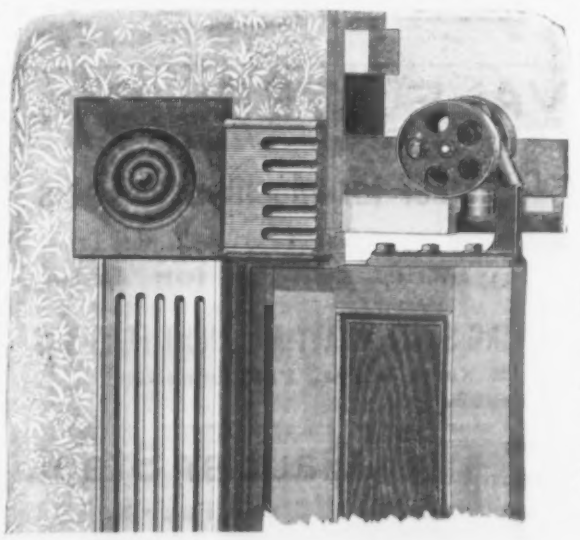

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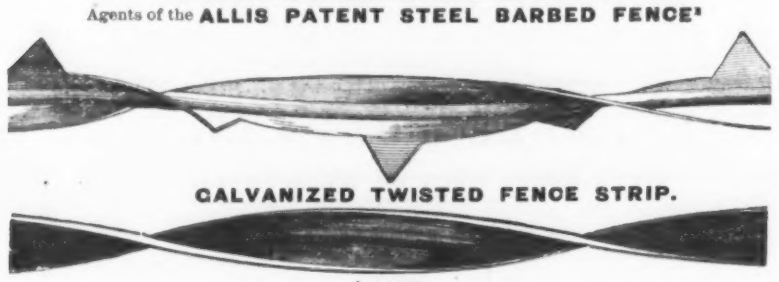

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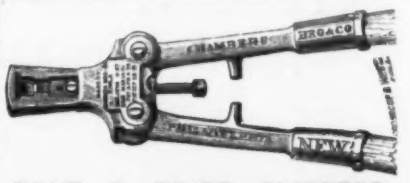

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TRADE MARKS, BRANDS, &c.

IN ORDER to meet a decided and constantly growing want, as made known and emphasized by almost daily inquiries asking for names and addresses of makers of iron, tools, tin plates, hardware, steel, machinery, oils, varnishes, japans, &c., &c., it has been decided to include in the

Ironmonger Diary and Text Book for 1884

(now in course of preparation) as complete a list as possible of trade-marks, brands, specialties, &c., made and in use in all parts of the world.

This list will exclude all ordinary trade announcements proper, and will be strictly confined to trade-marks and brands, whether blocks, electros, or other appliances for illustrations, with just sufficient letter-press to describe the kind of article to which the mark, &c., is applied, and the names and addresses of the owners or lawful users. For the sake of uniformity in space and charges, each mark will occupy a space measuring 1 inch deep by 1½ inches wide, and the uniform charge will be $2.50 (10s.) only for each such space, payable in advance, unless we have already an open advertising account with the firm giving the order.

The advertisements so inserted will be printed on colored paper, **classified under suitable heads,** and so arranged as to make them both effective and useful.

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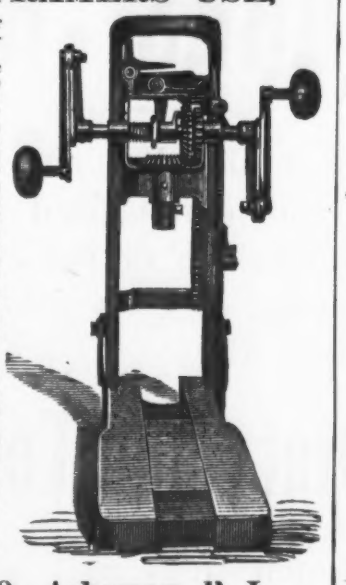
AUTOMATIC BORING MACHINES
FOR BUILDERS' AND FRAMERS' USE,



are universally acknowledged to be superior to all other *Boring Machines*, and we *guarantee* to give better *satisfaction* than any other machine.

Ship Builders, House Builders, Dock Builders, Bridge Builders, Carpenters and *Farmers* please notice what we claim for our machine, and we guarantee all thatwe claim: First, that it will do nearly double the work of any other machine in the same length of time, with greater ease to the operator; that we can regulate the speed of the bit according to the size of the same, or to suit the operator; it will drive the bit any required speed; it will drive the bit or auger to any required depth, and the bit or auger returns from the hole by the same automatic motion without the operator stopping the machine; at the same time clearing itself and leaving the hole entirely free from chips; it is gauged to bore such a depth as may suit the operator, boring two or more holes at exactly the same depth after being once set, without any attention from the operator; it is an angular machine and will bore on any angle; it is the most compact machine; it can be placed in so small a compass as to occupy but little room in a carpenter's tool chest, and while in this compact form it can be carriedin the hand with the greatest ease and convenience; it is the most durable machine, from the fact that we use the best material in its construction, and each part can be duplicatedin case of accident by sending directly to us. We finish the ironwork with a baked or heated Japan finish which enables it to withstand all kinds of weather, the woodwork being rubbed in oil and shellaced. They are the cheapest Boring Machines in the world for what they can do. We are introducing the Gladwin Improved Auger in connection with this machine. This auger is the best Boring Machine Auger made, being a self-clearer in gummy or knotty wood. We offer the Borer, boxed and delivered on board cars, for $5. with full set Gladwin Improved Augers, 18 qrs., $9; or with extra finished beds, $6.50, and full set augers, 18 qrs., $9.50. A discount given for large orders. Send for Descriptive Catalogue.

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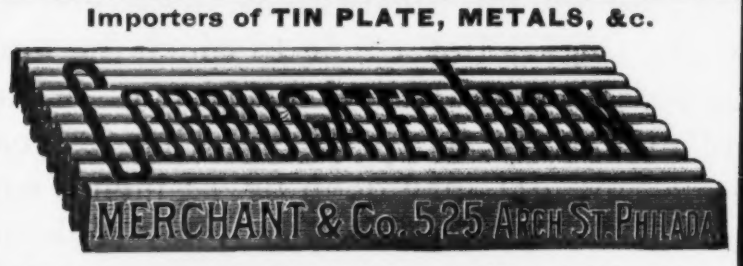

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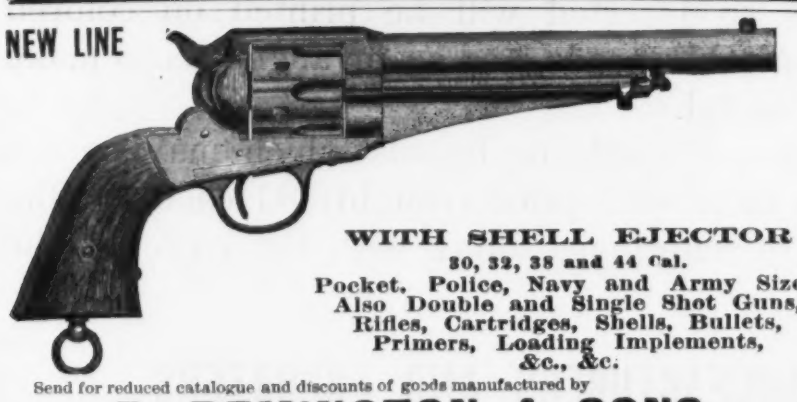

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The most simple, durable and economical steam flue cleaner.

It saves from 15 to 25 per cent. in labor and fuel.

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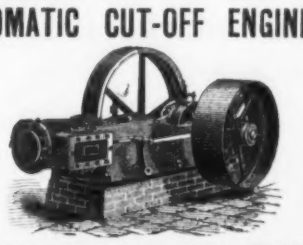

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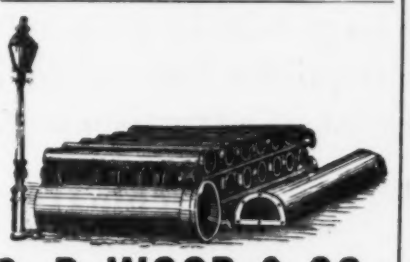

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Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING PACKING.

It will throw a continuous jet FROM FORTY TO SIXTY FEET. A new pattern jet and spray nozzle is sent with each pump.

Especial attention is called to the material and workmanship exhibited in these pumps.

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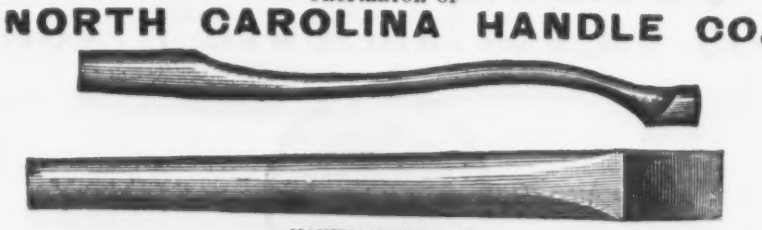

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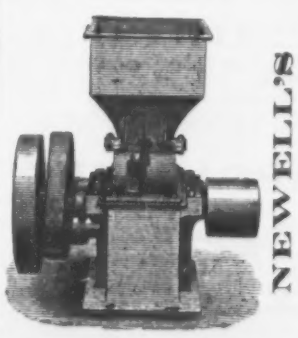

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Peter Wrights, ₩ lb ....11 @ 11¼c
Over 200 lbs 11¼c
Trenton 10½
Eagle Anvils, American, 100 ....dis 20 %

Apple Parers.
Globe Apple Pearers ....$5.50 net
Penn Apple Parers ....$4.50 net
Lots of 10 to 25 dozen special price

Axes.
Hunt's Kentucky and Yankee, per doz ....$8.50 @ 9.00
Robert Mann ....$8.00 @ 8.50
Richland Chief .... " $7.50 @ 8.00
Beveled Axes .... " add 50c net
Double Bit Axes ....net $14.50 @ 15.50

Augers and Auger Bits.—New List January 7, 1880.
Bates' Nut Augers ....dis 50 @ 55 %
Cook's Augers ....dis 40&10 %
Watrous' Ship Augers ....dis 15 %
Benjamin Pierce Auger Bits ....dis 40 %
Griswold Auger Bits ....dis 50 @ 55 %
Cook's " ....dis 40&10 %
Jennings' " ....dis 10, 10&10 %
Bonney's Pat. Hol. Augers, list $48 ₩ doz ....dis 25&10 %
Stearns' Pat. Hol. Augers, list $48 ₩ doz ....dis 20&10 %

Balances.
Light and Common ....dis 33⅓ %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells ....dis 70 %
Swiss Pattern Hand Bells ....60 %
Connell's Door Bells ....dis 15&10
Gt. Western & Kentucky Cow new list ....dis 60

Boring Machines
Upright, without Augers ....List 5.50 }
Angular, without Augers .... " 6.75 } dis 15 @ 50 %

Bolts.—Eastern Carriage Bolts ....dis 80&15 %
Philadelphia " ....new list dis 70&10 %
Stanley, Wrought Shutter ....dis 50&10 %

Braces.—Barber's ....dis 40&5 %
Backus ....dis 50 %
Spofford ....dis 50&5 %
American Ball ....dis 55 %

Butts.—Cast Fast Joint, Narrow ....dis 45&10&10 %
" " Broad ....dis 45&10&10 %
Cast Loose Joint, Narrow ....dis 55&10&10 %
" " Broad ....dis 55&10&10 %
" Acorn. Loose Pin ....dis 50&10&10 %
" " Jap'd ....dis 60&10&10 %
" Mayer's Loose Joint ....dis 60&10&10 %
Wrought Loose Pin ....dis 55&10 %
" Table Hinges and Back Flaps ....dis 50&10 %
" Narrow, Fast ....dis 50&10 %
" Loose Joint ....dis 55&10 %

Blind Butts.
Parker ....dis 70&2 %
Clark ....dis 70&2 %
Shepard ....dis 70 %
Lull & Porter ....dis 75&10 %
Huffer's ....dis 50 %

Chains.—German Halter and Coil, list December 31 1881 ....dis 50 @ 55 %
Galvanized Pump ....₩ lb 9½c net
Best Proof Coil Chain—English.
₩ lb .... 11 8¼ 7⅛ 6¼ 6 5¾ gold.
3-16 ¼ 5-16 ⅜ 7-16 ½ in.

Chisels.—Socket Framing ....dis 65&10 %
Socket Firmer ....dis 65&10 %
Butcher's ....$5.00 @ $5.25 to £ gold

Casters.—Bed (new list July 1, 1880,) ....dis 45 @ 50 %
Plate ....dis 45 @ 50 %

Coffee Mills.—Box and Side, new list Jan. 1, 1880 ....dis 50 %
Enterprise ....dis 25 %

Cutlery.—Walden Pocket ....new list net
Penna. Knife Co ....new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Drawing Knives.
Hart Mfg. Co.'s ....dis 65&10 %
Adjustable Handle ....dis 20 %

Fry Pans.
Tinned ....dis 45 %
₩ doz. $3.50 4.00 4.50 5.00 5.50 6.50 7.50 9.00 10.00
No.... 0 1 2 3 4 5 6 7 8
Burnished ....dis 60, 10 & 5 %
₩ doz. $3.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
No.... 0 1 2 3 4 5 6 7 8

Files.
Nicholson ....dis 45 %
Disston ....dis 45 %
Butcher

Fluting Machines.
Eagle—3½ in. roll ....each, $2.15 }
" —5½ in. roll .... " 2.85 } dis 35 %
Crown—3½ in. roll .... " 3.50 }
" —6 in. roll .... " 5.00 } dis 35 %
" —8 in. roll .... " 6.50 }
Geneva Fluter ....dis 25 %
Favorite com. Fluter & Sad Iron ....₩ doz $10.50 net

Hammers.
Yerkes & Plumb's, new list ....dis 30 %
Maydole Hammers ....dis 15 %
Howell A. E. Nail Hammers ....per doz. net $3.75

Handles.
Disston Loop Handles Crosscut ....33c pair net
Boynton Loop Handles Crosscut ....33c pair net

Hatchets.
Yerkes & Plumb, new list ....dis 30 %
Hunt ....dis 25 %

Hinges.
Strap and T ....dis 60&10&2 %

Horse Nails. Nos.	5	6	7	8	9	10	
Globe	24	21	19	18	17	16	dis 12½ %
Vulcan	26	23	21	20	19	18	dis 12½ %
Ausable	30	27	25	24	23	22	dis 30&10 %
" Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 30&10 %
Clinton	23	21	20	19	18		dis 30&10 %
" Polished & Pointed	24	22	21	20	19		dis 30&10 %
Saranac	26	23	21	20	19	18	dis 25 %

Hay and Straw Knives.
Lightning ....per doz. net $18.00
Electric .... " " 18.00
Wadsworth .... " " 10.50
Walton Straw Knives .... " " 17.00

Locks and Knobs.
Branford ....new list dis 50&2 % cash
Gaylord Cabinet ....dis 4 %
American Padlocks ....dis 30, 10&2 % cash
Scandinavian Padlocks ....dis 50 %
₩ doz. $5.00 5.50 6.50 7.50 8.50 10.00 12.50 } dis 60 %
No. 57 58 59 60 61 62 63
₩ doz. $18.00 26.00 33.00 } dis 60 %
No. 64 65 66

Lanterns.
Buckeye ....Large list net; small list net
Tubular ....No. 0, $7.50; No. 1, $9.00 ₩ doz net
Guards, 40 cents extra.

Lawn Mowers.—Pennsylvania }
Philadelphia } new list
Excelsior } dis 30 %

Lawn and Garden Pumps.
Holland Patent ....List $5.00 dis 10 %

Mattocks.
Long and Short Cutter ....new list ....50 %
Pennsylvania Pattern ....dis 50 %

Molasses Gates.
Enterprise Mfg Co.'s Measuring Faucets ....dis 5 %
Stebbins' Gates ....dis 70&10 %
Lincoln's " ....dis 60&10 %
Landers, Frary & Clark's Petroleum ....dis 20&10 %
Brass Liquor Cocks, new list Jan. 1 1880 ....dis 45 %
Cork Lined " ....dis 70 %

Meat Cutters.
Dixon's ....dis 25&5 %
Woodruff ....dis 25&5 %
Stowe ....dis 25&5 %
Hale's ....new list, dis 50, 10&2 cash
American ....dis 20&10 %
Stuffers ....dis 25&5 %
Enterprise Stuffers ....dis 25 %

Planes.—Sandusky Tool Co ....dis 20 %
Ogontz ....dis 25 %
Ohio & Auburn ....dis 20 %
Bailey (S. R. & L. Co.) ....dis 20&10 %

Plane Irons.—Ohio Tool Co ....dis 20&10 %
Butcher's ....$5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable ....dis 65&10 %
" Non-Adjustable ....dis 65&10 %

Picks.—New list ....50 %

Razor Strops.
Lamont Combination ....per doz. $4.00
" ....1 gross lots $42.00
Imitation Emerson ....per doz. 2.00

Rules.—Stanley Boxwood ....dis 70 &10 %
Stanley Ivory ....dis 55&10 %

Steelyards.—Hart's Pattern ....dis 40&10 %
₩ doz $14.50 17.75 21.00 26.50 31.00 35.50
Lbs 50 100 150 200 250 300
American Pattern ....dis 40&10 %
₩ doz $8.00 10.25 13.75 15.60 16.75 19.50
Lbs 50 100 150 200 250 300

Squares.
Steel and Iron ...dis 50; full case, dis 50&10&2 for cash
Try Squares, Stanley ....dis 50&10 %
Disston's Try Squares ....dis 40 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ....₩ doz $9.00 }
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ....₩ doz $8.50 } 30
Clipper No. 5, Painted Red, Boxed and Sharpened ....₩ doz $8.00 }

Saws.—Disston's Hand, Panel and Rip ....dis 20 %
Disston's Circular ....dis 40 %
" Cross-Cut No. 2, Plain Tooth ....dis 40 %
" Patent Tooth ....dis 40 %
" Champion Tooth ....dis 40 %
Boynton's Lightning Cross Cut, new list ....dis 40 %
" Lightning Buck Saws, cross bar ....dis 40 %

Shovels and Spades.
Oliver Ames & Sons, new list ....dis 15 %
Griffiths ....dis 50 @ 50&5
Rowland ....dis 50 @ 50&5

Sad Irons.—4 to 10 lbs ....₩ lb 3¼c
Mrs. Potts' Patent ....dis 35 %

Stone.
Washita Extra ....₩ lb 23½
" No. 1 .... " 18c
" No. 2 .... " 16c
" Slips .... " 37c
" Axe .... " 13c net
Hindostan Oil Stone No. 1 ....₩ lb 6c }
" Ave Stone .... " 8c } dis 33⅓ %
" Slips .... " 10c }

Screws.
Flat Head Iron, new list Dec. 27 ....dis 55 %
Flat Head Brass, new list Dec. 27 ....dis 55 %
Round Head Brass, new list Dec. 27 ....dis. 40 & 10 %
Round Head Iron, new list Dec. 27 ....dis. 45 & 10 %

Spoons.
Plated ....dis 40&10&5 %
German Silver ....dis 30&10&5 %
Britannia, Boardman's ....dis 60&10 %
" Parker's ....dis 60&10 %
Tinned ....dis 10 %

Springs.—Torrey ....dis 50 %
Gem No. 3 small Jap'd ....$2.00 }
" No. 2 medium Jap'd ....2.75 } dis 50 & 10 %
Coil No. 10, per gross net $6.00
Other Standard Springs ....dis 50&10 %
Warner Door Springs, per doz. net 1.75
Standard Spring Hinges—
Single No. 0, per doz. net 1.25
" No. 1, " " 1.40
Other Standard Spring Hinges ....dis 25&10 %

Stocks and Dies. ....dis 10&5 %

Stove Polish.—Gem ....₩ gross, $4.50, dis 5 %
Dixon .... " 6.00, dis 10 %
Fire Fly ....$3.00 gross net

Tacks. ....dis 30&10 %
Shoe Nails—4-8, and over 8c } 10 %
" " 3½-8, and under 9c }
Double Pointed Tacks ....dis 40&5 %

Traps.
Genuine Oneida—Newhouse ....dis 35 %
Im. Oneida—Newhouse list, first qual dis 55&5 @ 60 %

Vises.—Solid Box Trenton new list ....dis 35 %

Wrenches.—Agricultural ....dis 70 %
Coes' Genuine ....dis. 50&3 %
Coes' Mechanics' ....dis. 50&10&3 %
" " Mall. Bar ....dis 75 %

Wire.
Bright or Ann'd, No. 0 to 18 ....dis 57½ @ 60 %
" " No 19 to 26 ....dis 60 @ 65 %
" " No. 27 to 36 ....dis 62½ @ 70 %
Coppered, 0 to 18 ....dis 50 @ 50⅛ %
Tinned Broom Wire ....dis 57½ @ 60 %
Galvanized Barb Wire 7¼c
Painted Barb Wire 6¼c
Galvanized No. 7 to 18 .... Market List, dis 45 @ 17 % %

Wringers.
Peerless No. 2½ $52.00
" No. 2 ....45.00
Universal No. 2½ 42.00
" No. 2 ....45.00
Novelty No. 2, for common tubs 42.00
" No. 3 ....48.00
Excelsior E, for stationary tubs 51.00
" F " " 57.00

In lots of 1 doz. $3.00 doz. dis. from above price.

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.
1¼ to 4 by ¾ to 1 inch 2.50
4¼ to 6 by ¾ to 1 " 2.60
1¾ to 6 by 1⅛ to 1¼ " 2.90
1¼ and 1⅜ by ⅜ to ⅝ " 2.60
1 and 1⅛ by ⅜ to ⅝ " 2.70
⅝, ¾ and ⅞ by ⅜ to ⅝ inch 2.90

Rounds and Squares.
1 to 1⅝ ....2.50 | ⅝ to 9-16 ....2.70
2 to 2⅝ ....2.70 | ½ to 7-16 ....2.90
2¾ to 3¼ ....3.00 | ⅜ 3.10
3⅜ to 4 ....3.50 | 5-16 ....3.30
4¼ to 5 ....4.00 | ¼ 3.50
¾ to ⅞ ....2.60 | 3-16 ....5.50

Oval Iron.
½ to 1⅛ ....2.90 | 3.30
⅜ to ⅜ ....3.10 | 3.70

Half Oval and Half Round.
⅜ to 1¼ inch ....3.20 | ½ inch 4.00
⅜ to ⅜ " ....3.70 | ⅜ " 5.50

Horse Shoe.
⅝ to 1⅛ by 5-16 to ⅝ inch 3.50

Wagon Box Iron.
⅞ Inch, Nos. 13 and 14 ....3.70
" " 11 and 12 ....3.50
¾ " " 13 and 14 ....4.00
¾ " " 11 and 12 ....3.80
⅝ " " 13 and 14 ....4.40
⅝ " " 11 and 12 ....4.10

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch 2.70
1⅛ to 3¼ by ¼ and 5-16 " 2.70
1 to 1⅛ by ¼ and 5-16 " 2.80
¾ to ⅞ by ¼ and 5-16 " 3.00
⅝ and ⅜ by ¼ and 5-16 " 3.50

Light Bands.
1¼ to 6 by ⅛ to 3-16 ....3.00
1⅛ to 6 by Nos. 11 and 12 ....3.10
1 to 1⅛ by ⅛ to 3-16 ....3.10
1 to 1⅛ by Nos. 11 and 12 ....3.20
⅞ and 13-16 by ⅛ to 3-16 ....3.40
⅞ and 13-16 by Nos. 11 and 12 ....3.50
¾ and 11-16 by ⅛ to 3-16 ....3.70
¾ and 11-16 by Nos. 11 and 12 ....3.80
⅝ and 9-16 by ⅛ to 3-16 ....4.00
⅝ and 9-16 by Nos. 11 and 12 ....4.10
½ inch by ⅛ and 3-16 ....4.30
½ inch by Nos. 11 and 12 ....4.40

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 ....3.30
1¼ to 2, Nos. 16, 17 and 18 ....3.40
1¼ to 2, No. 19 ....3.50
1¼ to 2, No. 20 ....3.60
1¼ to 2, No. 21 ....3.70
1¼ to 2, No. 22 ....3.80
15-16 1, and 1⅛, Nos. 13, 14 and 15 ....3.50
15-16, 1, and 1⅛, Nos. 16, 17 and 18 ....3.60
15-16, 1, and 1⅛, Nos. 19 and 20 ....3.70
15-16, 1, and 1⅛, No. 21 ....3.80
15-16, 1, and 1⅛, No. 22 ....3.90
⅞, Nos. 13, 14 and 15 ....3.70
⅞, Nos. 16, 17 and 18 ....3.80
⅞, Nos. 19 and 20 ....3.90
⅞, No. 21 ....4.00
⅞, No. 22 ....4.10
13-16, Nos. 13, 14 and 15 ....3.90
13-16, Nos. 16, 17 and 18 ....4.00
13-16, Nos. 19 and 20 ....4.10
13-16, No 21 ....4.20
13-16, No. 22 ....4.30
¾, Nos. 13, 14 and 15 ....4.00
¾, Nos. 16, 17 and 18 ....4.10
¾, Nos. 19 and 20 ....4.20
¾, No. 21 ....4.30
¾, No. 22 ....4.40
11-16, Nos. 13, 14 and 15 ....4.20
11-16, Nos. 16, 17 and 18 ....4.30
11-16, Nos. 19 and 20 ....4.40
11-16, No. 21 ....4.50
11-16, No. 22 ....4.60
⅝, Nos. 13, 14 and 15 ....4.40
⅝, Nos. 16, 17 and 18 ....4.50
⅝, Nos. 19 and 20 ....4.60
⅝, No. 21 ....4.70
⅝, No. 22 ....4.80
⅝, No. 23 ....4.90
9-16, Nos. 13, 14 and 15 ....4.60
9-16, Nos. 16, 17 and 18 ....4.70
9-16, Nos. 19 and 20 ....4.80
9-16, No. 21 ....4.90
9-16, No. 22 ....5.00
9-16, No. 23 ....5.10
½ inch, Nos. 13, 14 and 15 ....4.80
½ " Nos. 16, 17 and 18 ....4.90
½ " Nos. 19 and 20 ....5.10
½ " No. 21 ....5.20
½ " No. 22 ....5.30
½ " No. 23 ....5.40

The prices under Hoop Iron do not apply to Cotton Ties.

1-10c per lb. extra will be charged for each gauge lighter than the lightest indicated.

1-10c per lb. extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 lbs., per set of 6 hoops 3.50
8 lbs. and less than 9 lbs. per set of 6 hoops 3.60
Less than lbs. per set of 6 hoops 3.80

Extras for Cutting to Length all Preceding Iron.
All Iron, including Tire 1.10c

Tank Iron.
No. 9 and heavier 3.30
Plow Slabs 3.50
" Wings 3.80

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.50	5.00	6.50
No. 15 to 17	3.80	5.30	6.80
No. 18 to 21	4.10	5.60	7.10
No. 22 to 24	4.30	5.80	7.30
No. 25 & 26	4.50	6.00	7.50
No. 27	4.70	6.20	7.70
No. 28	5.10	6.60	8.10

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10c extra.

Wood's Patent Planished Sheet.
1st quality (A) ....10½c | 2d quality (B) ....9 c

Galvanized C. H. B.—(Charcoal Hammered Blooms.
Nos. 14 to 20 ....12c | No. 27 ....15c
Nos. 21 to 24 ....13c | No. 28 ....16c
Nos. 25 and 26 ....14c | No. 29 ....18c
45 @ 47½ % discount.

Coal Screen Iron.
1¾ by ⅝ by 5-16 ....3.0c | 1 by ⅝ by 5-16 ....3.50

Angle Iron.
2½, 3, 3½ and 4 inch 3.30
1½, 1¾ 2 and 2¼ inch 3.30
1¼ inch 3.40
1 " 3.60
1⅛ by 1 inch, for Plow Handles 3.80
1⅛ by ¾ " " " 3.80
1⅛ by ¾ " " " 3.90

T Rail.
8 lbs. to the yard ....2.90 | 20 lbs. to the yard 2.80
12 " " ....2.80 | 28 " 2.80
16 " " ....2.80 | 30 " 2.80

Splice Joints for 12, 16 and 20-lb. Rail, 40c each; 28 and 30 lb. Rail, 50c each; 40 lb., 60c each.
3½ by ⅜ and ½ Spikes for 20 and 28-lb. Rail 3¼c
2½ and 3 by ⅜ " " 12 and 16-lb. " 4c
2½ by 5 16 " " 8-lb. Rail 4½c

Flat Rails.—Punched and Countersunk.
1½ to 2 by ½ to ⅝ inch 3.00
1⅛ by ⅜ and 7-16 inch 3.20
1¼ by ⅜, 7-16 and ½ inch 3.50

Juniata Nail Rods 6.40
Norway " 8.00
Guard Iron ⅞x⅜x⅜ and ⅞x⅜x⅜ 4.00
" ⅜x⅝x9-16 and ⅞x⅝x¼ 4.20
Drag Bars 3.30
Dropper Bars 3.80
Cylinder and Landside Iron 3.20
Plow Beam Iron 4.00

Nails.
See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.
⅜ to 2 inches, inclusive 10½c
1-16 and 2⅛ to 3 inches 11½c
¼ and 3⅛ to 4 " 12½c
7-32 and 4⅛ to 5 " 13½c
3-16 and 5⅛ to 6 " 16c
5-32 inch 21c
⅛ inch 30c
Oil Well Steel Forgings 30c

Machinery Steel.

	Crucible.	Bessemer & Open Hearth
Ordinary Sizes, ⅜ to 2 inch Round	6c	4c
5-16 and 2⅛ to 3 inches	7c	5c
¼ and 3⅛ to 6 "	8c	7c
7-32 inch	10c	8c
3-16 "	12c	10c

Square, Flat and Octagon, ½c extra throughout the list.
Cut to specified lengths, ½c extra.

Hammer Cast Steel.
Crucible Cast Steel 7c
Open Hearth Cast Steel 6c

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	13c	11c	9c	7c

1c. extra for each additional gauge.
Cut to multiples or specified lengths, ½c. extra.

Miscellaneous Cast Steel.
Auger and Auger Bit 7c
Axle Steel for carriages and wagons 7c
Frog Points and Plates 7c
" Side Bars 6c
Pick, plain (hammered) 8c
" and Mattock, beveled (rolled) 7c
Skate Steel 7c
Table Cutlery, plain 6c
Table Cutlery, beveled 6½c
Pike and Cant Hook 8c
Coal and Granite Wedge 8c
Roller 8c
Spindle, subject to Machinery classification 8c
Trap Spring Steel 9c
Forged Crank Pins and Lathe Spindles 9c
Piston Rods, plain 7c
" forged to shapes 9c
Slide Bars, plain 8c
" forged to shapes 9c

Crucible, Open Hearth or Bessemer.
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick 6c
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick 7c
Circulars and semi-circulars, when ordered separately 8c
Smoke Stack, to shape 7c
Locomotive Tank Steel 6c

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8-inch and over 8c
Mill Saw, 8-inch and over 8½c
Taper, 3½-inch and over 9½c
Horse and Shoe Rasp 8½c

Spring Cast Steel.
Spira Taper, cut to lengths 6½c
....7c

Tire Cast Steel.
1x⅛ and over 8½c
1x3-16, ⅞x3-16 and ⅛ 9c
1 and 13-16x⅛ and 5-32, ⅞x3-16 and 5-32 ....9½c
¾ and ⅝x⅛ and 3-32 and 12 g 10c
Solid Safe Cast Steel 7½c
Three and Five Ply Cast Steel 10c

Agricultural Implement Cast Steel.
Fork and Rake, Crucible 6c
Horse Rake Steel, cut to lengths, Crucible 7c
Hoe, Crucible 6c
Corn Stalk Cutter, beveled 6c
Beveled Hoe and Shovel Steel in Bars 7½c
Crucible Plow Steel in slabs 7c
....6c

Bessemer and Open Hearth.
Spring 4½c
" spiral and taper, cut to lengths 5½c
Tire, 3-16 thick and above 4½c
Toe Calk 4½c
Plow 4½c
Axle Billets 4½c
Sleigh Shoe 4c
Cutter Shoe, cut to lengths and tapered 4c
Scythe Back Steel 5½c
Grain Drill Bars 4c
" Points 6c
Rolling Coulter Blanks, cut and punched 7c
Thrasher Steel 9½c
" Teeth 4½c
Rolled Hammer Billets 5½c
....4½c

Terms.—Four months: 2 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace Floor and Straightening Plates 1¾c
Housings and Castings not otherwise specified 2¾c
Guide Plates 3¼c
Spindles and coupling boxes 3½c
Sand Rolls and Pinions, large size ....3 c
" small size 3¼c
Pipe Mill Castings ....5 c
Rolling Mill Castings under 50 lbs ....4 c
Spur and Bevel Wheels, large ....4 c
" " small 4½c
Pulleys up to 30 inches 4½c
" over 30 inches ....4 c
Engine Castings, light 4½c
" " heavy ....4 c

Chilled Rolls.
6 to in. diam.. to 20 in. long 4½c
8 to 15 in. " 8 to 40 in. " 4½c
25 to 24 in. " 15 to 72 in. " 4c
14 to 31 in. 72 to 108 in. " 4c

After Oct. 1, 1881, no discounts will be made at settlement as heretofore, prices quoted being net.

White and Red Lead.
Strictly Pure White Lead in Oil, in kegs, 6¼c.; in 25 lb Tin Pails, ½c. ₩ lb over keg price; 12½ lb Tin Pails, 1c ₩ lb over keg price; assorted, 1 to 5 lb cans, 3c. per lb over keg price.
Dry White Lead in barrels 6¼c
Red Lead, very brilliant, in kegs, 6½c; in barrels 6¼c
Litharge (Potter's Lead) 6½c; 6¼c
Freights equalized with all points where White Lead is made.
Terms: Note at sixty days, or if paid within 15 days from date of invoice a discount of 2½ per cent. will be allowed, but not otherwise.

Window Glass.
Discount, 70 % on Single Strength, 70 & 10 % on Double.

Size.	AA.	A.	B.	C.
Single Strength.				
5 x 8 to 10 x 15	$8.25	$7.50	$7.00	$6.50
11 x 14 to 16 x 24	9.25	8.50	8.00	7.25
18 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	8.00
26 x 28 to 24 x 36	13.00	11.50	9.75	9.00
26 x 36 to 26 x 44	14.50	13.25	10.75	9.50
26 x 46 to 30 x 50	15.00	14.00	11.25	10.50
30 x 52 to 30 x 54	16.00	14.50	12.00	
30 x 56 to 34 x 56	17.25	15.50	13.50	
34 x 58 to 34 x 60	18.25	17.25	15.00	
36 x 60 to 40 x 60	20.75	18.75	17.25	
Double Strength.				
6 x 8 to 10 x 15	12.75	11.75	10.75	10.00
11 x 14 to 16 x 24	14.50	13.25	12.50	11.25
18 x 22 to 20 x 30	17.25	15.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	25.75	23.25	19.25	
30 x 50 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.
Axes, Single Bit, Lippincott ....Per doz. $8.00
" " James & Co .... " 7.00
" Double Bit, Lippincott .... " 15.00
" " James & Co .... " 12.00
Drain Tools, list ....dis 20%
Hoes, Planters' ....dis 55%
" Scovill Pattern ....dis 55%
" Handled, Square Eye, German ....dis 25%
Handles, Cross Cut ....Per doz. $3.50
" Shovel, Bent, Bored, Riveted .. " 2.50
Saws, Circular ....dis 45%
" Long ....dis 40%
" Cross Cut, H. B. & Co., Champion, Per ft. net $0.35
" Cross Cut, Lippincott, Champion, Per ft. net 30
Shovels, list ....dis 20%
Spades, " ....dis 20%
Scoops, " ....dis 20%

BOSTON.

Reported by Macomber, Bigelow & Dowse.

Anvil & Vise.—
No. 1, $4.25; 2, 4.25; 3, 3.50 each.....dis 25 %

Augers & Bitts.—Snell's Auger.....dis 40&10 %
L'Hommedieu's Ship Auger.....dis 15 %
Jenning's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40&10 %
Shepardson's Double-Cut Bitts.....dis 45 %
Shepardson's Double Gimlets.....dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ doz., $48.00; No. 3, ₱ doz., $60.00 list..dis 20 %
Bonney's Extension Hollow Augers.....₱ doz $36.00
Pierce's Bitts.....dis 50 %
Griswold Bitts.....dis 60 %

Axes.—Blue Jackets.....₱ doz $9.00
Red Cross.....₱ doz 8.00
Red Cross Handled.....₱ doz 12.00
Dowse Handled Boys'.....dis 33⅓ %

Ax Handles.—
Oak Extra, 32 in., No. A.....₱ doz $2.40
Oak Extra, 34 in., No. A.....₱ doz 2.40
Oak Extra, 32 in., No. B.....₱ doz 2.00
Oak Extra, 34 in., No. B.....₱ doz 2.00
Oak Extra, 32 or 34 in., No. C.....₱ doz 1.40

Axle Clips......dis 50 %
Balances.—Chatillon's.....dis 33⅓ %

Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....₱ ft. 30
Cast Half Round.....₱ ft., ⅝, 30; ¾, 40
Wrought Round.....₱ ft., ⅝, 30; ⅞, 40; 1, 50

Bells.—Connel's Crank Gong, reduced list..dis 15&10 %

Bird Cages.—
Japanned M. B. & D., reduced list, 1879.....dis 40 %
Brass M. B. & D., reduced list 1879.....dis 33⅓ %

Blind Fasts.—Lock Fasts.....₱ C sets $5.00
No. 6 Fasts.....₱ C sets 6.00
Veazie Fasts.....₱ C sets 6.00
Shedd's.....₱ C sets 7.00
Bed Hinges.—Mall, Hook, 3 holes.....₱ C sets 7.00

Brass Awl Handles.—
Phœnix Adjustable.....₱ doz $2.00

Bolts.—Norway Iron Carriage.....dis 75 %
Common Iron Carriage.....dis 50 & 10 %

Borax.—Refined.....₱ lb 14c

Boring Machines.—
Eagle Upright each.....$5.50 list } dis 40&10 %
Eagle Angle each.....6.75 list }
Snell Augers.....₱ set $2.45

Braces.—Barber's.....dis 40&5 %
Spofford's.....dis 40&5 %
Backus'.....dis 50&5%

Bracket Saws.—Holly Scroll Saw.....each $2.25
Demas Lathe and Scroll Saw.....each 6.50
Bracket Saws, extra quality, to No. 5.....₱ gro 0.75
Steel Frame, with patterns.....₱ doz 6.50
Lester.....dis 20 %
New Rogers, all iron.....dis 25 %

Bracket Saw Blades.—Grimth's pat.....₱ gross 7.50

Brackets.—
H. B. & M. Flower Pot, reduced list.....dis 15&10 %
Bronzed Shelf, M. B. & D., new list.....dis 50 %
Store Shelf.....dis 40 %

Butts.—Union Fast Joint.....45&10 %
Union Loose Joint.....dis 55&10 %
Udion Japanned Acorn.....dis 55&10 %
Union Silvered Acorn.....dis 55&10 %
Union Boston Finish.....dis 70&10 %
Union Spiral Spring.....dis 25&10 %
Wrought Brass.....dis 65&10%

Carriage Bolts.—Eagle Norway.....dis 70&10 %
Common.....dis 80 & 5 %

Carriage Jacks.—Climax No. 1.....₱ doz $27.00
Climax No. 1½.....₱ doz 15.00
Climax No 2.....₱ doz 13.50
Universal.....dis 25 %
Universal No. 1.....each, $2.00
Universal No. 2.....each 3.00
Universal No. 3.....each 4.00
Universal No. 4.....each 6.00
Universal No. 5.....each 6.50

Cartridges.—U. S. Cartridge Co.....dis 70 %

Cards.—
Watson's make Horse & Curry.....dis 10 % } Rev. List,
Watson's Cotton.....dis 10 % } Aug., 1883.
Watson's Wool.....dis 10 % }

Casters.—Bed and Table.....dis 50 %

Chain.—Traces 6½, 10, 4, straight.....₱ pair 50c
Traces 6½, 10, 4, twisted.....₱ pair 55c
Traces 7, 12, 2, twisted.....₱ pair 80c
Coil 3-16.....₱ lb 10½c
Coil ¼.....₱ lb 8½c
Coil 5-16.....₱ lb 7c
Coil ⅜.....₱ lb 6½c
Coil 7-16.....₱ lb 6c
Coil ½.....₱ lb 6½c

Chalk.—White, Carpenter's.....₱ gross 60c
Red, Carpenter's.....₱ gross 80c
Blue, Carpenter's.....₱ gross $1.00

Chisels.—Hart, Bliven & Mead, Framing..dis 60&10&10%
Underhill, Framing.....dis 25 %
Buck's Chisels.....dis 40 %

Clothes Line.—
Galvanized Wire, 100 feet each.....₱ doz $1.00

Coal Hods.—"Dover."—Galvanized, New List.dis 60%
Japanned, new list.....dis 60 %

Cocks.—Brass. L. F. & Co.....dis 50 %

Coffee Mills.—New List.....dis 45 %

Copper Rivets......dis 50&10 %

Cordage.—Manila, usual trade dis 1c.....₱ lb 15½c
Jute.....₱ lb 8c

Cow Ties......dis 33⅓ %
No. 50, 3 ft. No. 6 Wire, with toggle.....₱ doz $3.80
No. 55, 3 ft. No. 6 Wire, with snap.....₱ doz 4.00
No. 60, 3½ feet No. 6 Wire, with toggle.....₱ doz 4.20
No. 65, 3½ ft. No. 6 Wire, with snap.....₱ doz 4.50
No. 50, 4 ft. No. 4 Wire, with toggle.....₱ doz 4 75
No. 55, 4 ft. No. 4 Wire, with snap.....₱ doz 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle.....₱ doz 5.60
No. 65, 4½ ft. No. 3 Wire, with snap.....₱ doz 6.00

Crow Bars.—Cast Steel.....₱ lb 7½c
Iron Steel-pointed.....₱ lb 6c

Cutlery.—Pocket American Shear Co.'s.....dis 40 %
Butcher Knives Wood's, Lap Bolster, Square Handle.....dis 30 %
Steak Knives.....dis 25 %
Lap Bolster, Oval Handle.....dis 20 %
Stacking.....dis 20 %
Skinning.....dis 30 %
Butcher, Common Round Handle, Wood's.....dis 20 %
Shoe Knives, Wood's.....dis 20 %

Dividers.—Cook's.....dis 25 %

Dog Collars......dis 20 %

Door Springs.—Torrey's Rod.....₱ doz $1.65
Imitation Torrey's Rod.....₱ doz 1.45
Gem Coil, new list.....dis 50 & 10 %
Crown.....₱ doz 1.20
Warner's.....₱ doz 2.00

Door Stops.—Thurston's.....dis 50 %

Drawer Knobs.—Thurston's.....dis 50 %

Drills.—Morse Bitt Stock.....dis 25 %
Morse Straight Shank.....dis 20 %

Emery.—Wellington Mills.....₱ lb 10c
Walpole Emery Mills.....₱ lb 6c
Turkish in 10 lb cans.....₱ lb 8c

Enameled Ware.—
Standard Mfg. Co. Kettles.....dis 50 & 10 %
Standard Sauce Pans.....dis 30 %

Felloe Plates.—Wrought.....₱ lb

Files.—American File Co.....dis 45 %
Nicholson File Co.....dis 45 %

Fluting Machines.—Knox list, $1.00.....dis 20 %
American list, $1.40.....dis 20 %

Forks.—W. C. & Co. Manure.....dis 50 %

Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz .65

Glass Cutters.—Combination Glass Cutter and Knife Sharpener.....₱ doz $1.00

Grub Hoes.—K. P. & Co.'s No 2, $11.50 ₱ doz.dis 50 %

Hammers.—Maydole's.....dis 15 %
Eartford Hammer Co.....dis 20 %

Hangers & Rollers.—Anti-Friction.....dis 50 %
Acme Rollers.....dis 50 %
Climax.....dis 50 %
Common Hangers.....dis 50 %
Common Rollers.....dis 50 %

Hand Screws......dis 10 %

Hatchets.—C. F. Dowse new list.....dis 33⅓ %
Underhill.....dis 30 %

Hay Knives.—Lightning.....₱ doz. $18.00, net
Fisher's Patent.....₱ doz $14.00

Hinges.—Strap and T (new list).....dis 60 %
Providence Plate.....₱ lb 8c
Wrought Screw Hook.....₱ lb 6c

Hoes.—W. C. & Co.'s.....dis 50 %

Hooks and Staples.—Brewers' (new list).....dis 60

Horse Nails.

	No. 6	7	8	9	
National Finished	.23	.21	.20	.19	dis 20 %
Putnam Pointed	.24	.22	.21	.20	dis 5 %
Bridgewater	.21	.19	.18	.17	list

Ice Cream Freezers.—Packer's, new list.....dis 40 %

Knobs.—"Norwalk." New list.....dis 60 %
Silver Glass.....dis 50&10 %
Silver Glass Bell Pulls.....dis 55&10 %

Lanterns.—Tubulars, No. 0.....₱ doz 8.00

Lawn Mowers.—The "Daisy."
12 in. cut.....each, $8.00
14 in. cut.....each 8.50
16 in. cut.....each 9.00
18 in. cut.....each, 9.50

Lead.—Sheet.....₱ lb 7½c
Pipe.....₱ lb 6½c

Locks.—Norwalk.....dis 50 %
Eagle Cabinet.....dis 25 %
Eagle Trunk.....dis 15 %
W. Wilcox & Co., Padlocks.....dis 50 %

Manure Forks.—W. C. & Co.....dis 50 %

Mattocks.—
K. P. & Co., Long Cutter, $16.00 ₱ doz.....dis 50 %
K. P. & Co., Short Cutter, $15.50 ₱ doz.....dis 50 %
K. P. & Co., Pick Cutter, $16.00 ₱ doz.....dis 50 %

Measuring Tapes.—Eddy's.....dis 20 %

Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's, (new list).....dis 40 & 10 %
American.....dis 25 %

Money Drawers.—Tucker lar's Am.....₱ doz $22.50

Mouse Traps.—Delusion.....₱ doz 1.40
Novelty.....₱ doz

Nails......₱ keg 3.40

Oilers.—Zinc and Tin.....dis 50 %
Brass and Copper.....dis 40 %

Ox Bows.—Extra finished and varnished.....dis 10 %
1¼ in., ₱ doz. pair...$7.00 | 2 in., ₱ doz. pair, $10.00
1⅝ in., ₱ doz. pair... 9.00 | 2½ in., ₱ doz. pair 12.00

Paper.—Tarred Sheathing.....₱ lb 2½c
Tarred Eagle Brand.....₱ lb 2½c

Picks.—K. P. & Co., Adze Eye, 5 to 6 lb $12.00.....dis 50 %
K. P. & Co., Adze Eye, 6 to 7 lb $13.00.....dis 50 %

Planes.—
Fancy Planes.....dis 10 %
Razee Planes.....dis 20 %
N. Y. Tool Co.....dis 25 %
English Iron.....dis 20 %
Bailey's.....dis 20&10 %

Plated Ware.—Rogers & Bro.....dis 40&5 %

Pliers.—Vom Cleff & Co.'s.....net list
Button's Wire Pliers.....dis 33⅓ %

Plumb & Levels.—Stanley R. & L. Co...dis 60&10 %

Pocket Knives.—American Shear Co.'s.....dis 40 %

Potato Diggers.—W. C. & Co., reduced list..dis 40 %

Pulleys.—Acme or Excelsior, 1¾ in.....₱ doz 24c
Acme or Excelsior, 2 in.....₱ doz 27c

Pulley Blocks......dis 35 %

Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 40 %
Iron Pitcher Spout.....dis 50 %
Copper.....dis 30 %

Rivets.—Black (new list).....dis 40 %
Carriage in 10 lb papers (new list).....dis 40 %
Copper.....dis 33⅓ %

Razors.—Torrey's.....dis 25 %

Razor Straps.—Torrey's.....Full line

Rules.—Stanley, Boxwood.....dis 70 &10 %
Stanley, Ivory.....dis 50&10 %

Sad Irons.—Common.....₱ lb 2½c
Laundry.....₱ lb 3 6c
Tailors' Geese.....₱ lb 5 c
Enterprise, "Potts".....dis 35 %

Sash Locks.—King & Hutchinson's, new list.dis 40 %

Sandpaper.—Baeder & Adamson.....dis 30 %
M. B. & D.....dis 10 %

Sash Weights.—Patent Eye.....₱ lb 2½c

Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 20 %

Cross-Cut Saws.
W. M. & Co., Common Tooth, No 1.....₱ foot 15c
W. M. & Co., Champion Tooth.....₱ foot 15c
Disston's, Common Tooth.....₱ foot 66c dis 20 %
Disston's Great American Tooth...₱ foot 66c dis 20 %
Boynton's Light Ing Tooth.....₱ foot 40c
M. B. & D., Hand Saws.....dis 33⅓ %
W. M. & Co.'s Circular Saws.....dis 15 %
Richardson Bros.....dis 20 %

Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Griffith, Extra.....₱ doz $2.40
Welch & Griffith, No. 2.....₱ doz 1.00

Scales.—Fairbanks.....dis 20 %

Screws.
American Flat-Head Iron.....new list, dis 65 & 5 %
American Flat-Head Brass.....new list, dis 65 & 5 %
American Round-Head Brass.....new list, dis 45 & 5 %
American Round-Head Iron.....new list, dis 60 & 5 %
Grilley Round Head Nickel-Plated Common..dis 40 %

Scythes.—Clippers, in boxes.....₱ doz $6.75

Shaves.—Kimball's.....₱ inch 75c
Watrous.....dis 10 %

Shears.—American Shear Co., new list.....dis 50 %

Shot.—Tatham's.....₱ lb 7c

Shovels.—O. Ames, new list.....dis 15 %
O. Ames, other brands, new list.....dis 15 %
M. B. & D.....dis 15 %

Sinks.—Magee Patent.....dis 30 %

Snow Shovels......$4.00

Skates.—Union.....dis 20 %
Acme.....dis 20 %
Imperial Club list No. 5, $3.75 ₱ pair list No. 7, $4.00 ₱ pair.....dis 25%

Stocks and Dies.—King's.....dis 10&5 %

Tacks.
Swedes Tinned.....dis 30&10 %
Swedes Iron.....dis 30 & 10 %
Gimp and Lace.....dis 20 & 10 %
Copper Tacks.....dis 5 & 10 %
All balances on list.....dis 20&10 %

Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 40 %
Blake's.....dis 40&10 %

Vises.—Simpson's Adjustable.....dis 25&5 %
Howard Vise Co.....dis 25 %
Prentiss'.....dis 20 %

Weather Strips.—Packer's.....₱ doz $4.00
Browne's Flexible Rubber.....dis 30 %
In 25 feet boxes: No. 1, ⅜ in. wide, ₱ yard, 10c.; No. 2, ⅝ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in. 25c
Black Walnut Spring Weather Strips..₱ doz $5.00

Window Springs......d's 33⅓ %
Babcock's No. 3.....₱ gross $6.24
Babcock's No. 4.....₱ gross 4.16

Wire Cloth.—"Clinton".....₱ ft.

Wire Fence.—Scutt's Patent, Painted.....₱ lb 6½c
Scutt's Patent, Galvanized.....₱ lb 7½c

Wire Goods.—Gate Hooks and Eyes, &c., dis 50&10 %

Wrenches.—A. G. Coe's.....dis 50 %
Girard Mfg. Co.....dis 50 & 10 %
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Novelty No 2 for Common Tubs.....₱ doz 42.00
Novelty " 3 " " " " .....₱ doz 48.00
Excelsior E " Stationary Tubs.....₱ doz 45.00
Excelsior F " " " " .....₱ doz 45.00
Excelsior A with Folding Bench.....₱ doz 60.00
Excelsior B " " " " .....₱ doz 60.00
Novelty Set Tub, E.....₱ doz 40.00
Keystone, Wood Frame No 1½.....₱ doz 30.00
Keystone, Iron Frame No 2½.....₱ doz 37.50

Zinc......₱ lb 6½c

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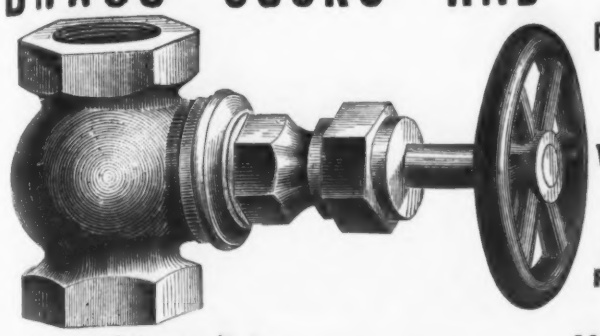

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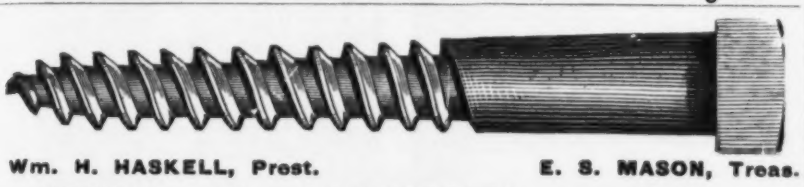

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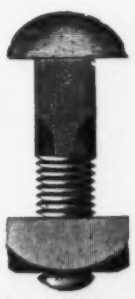

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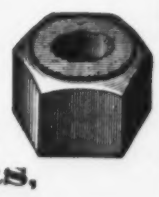

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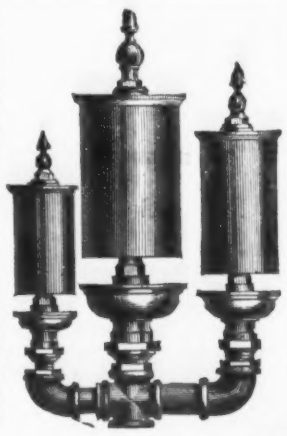

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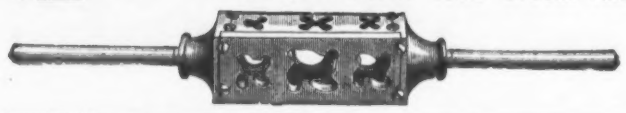

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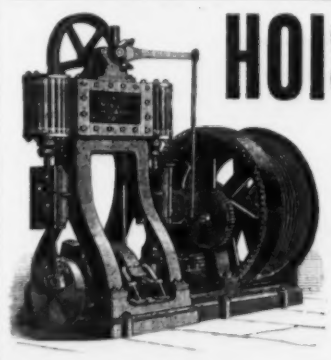

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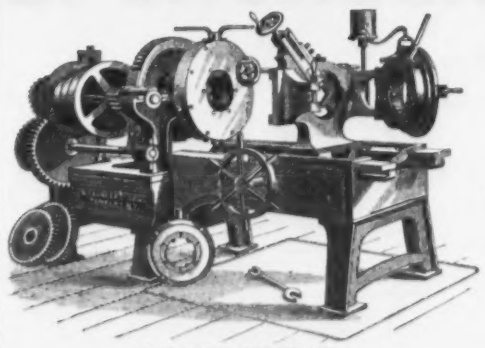

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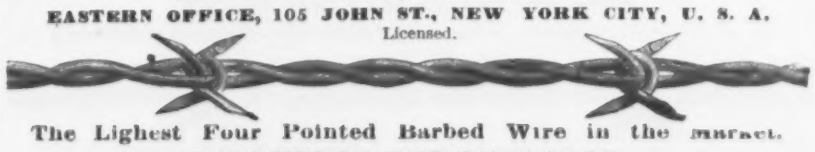

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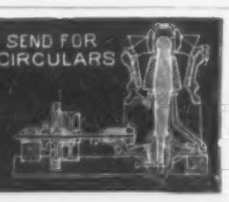

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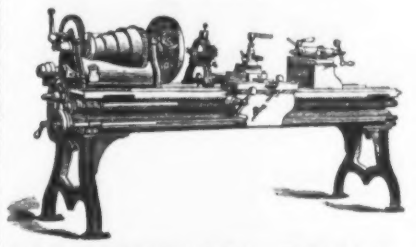

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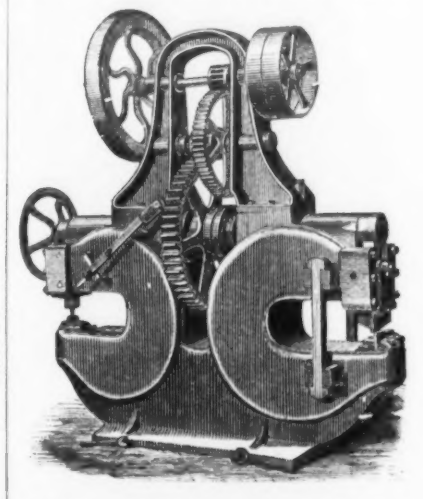

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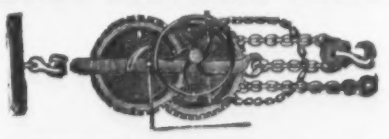

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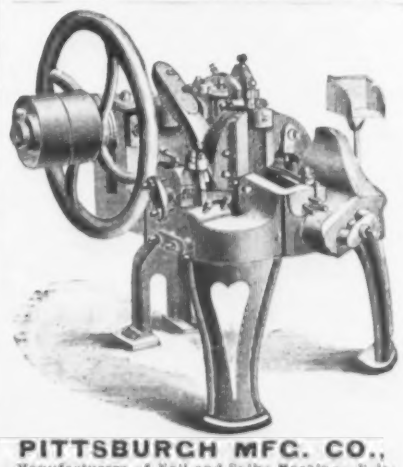

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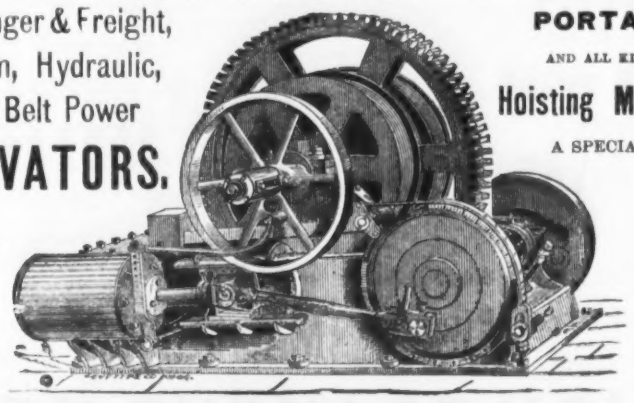

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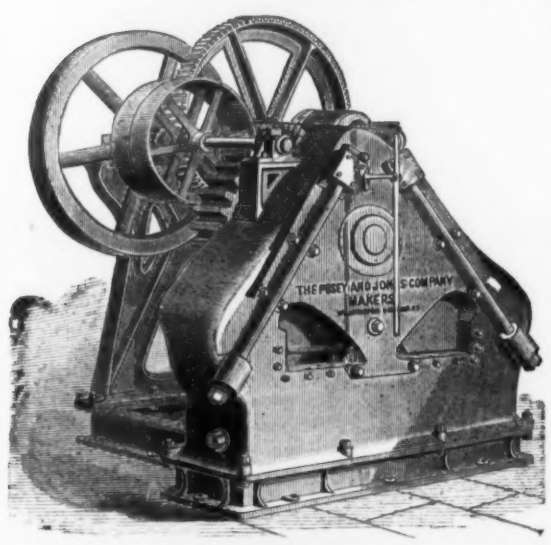

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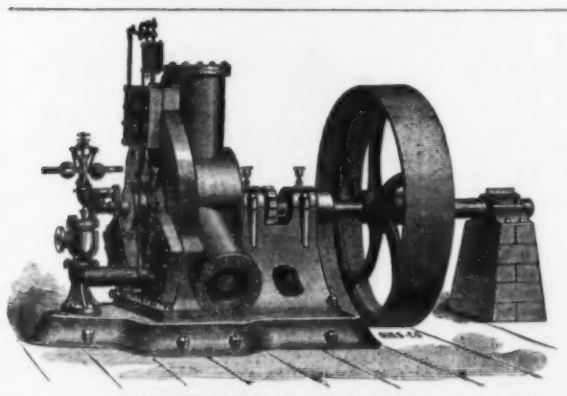

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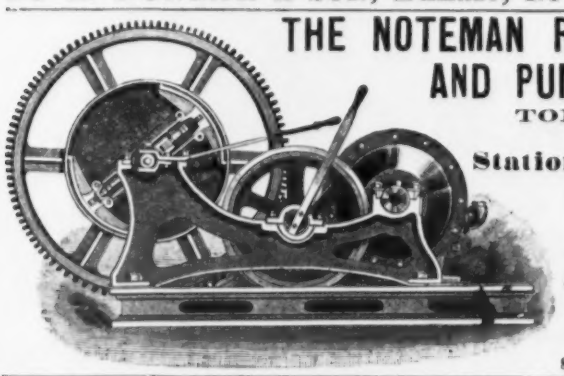

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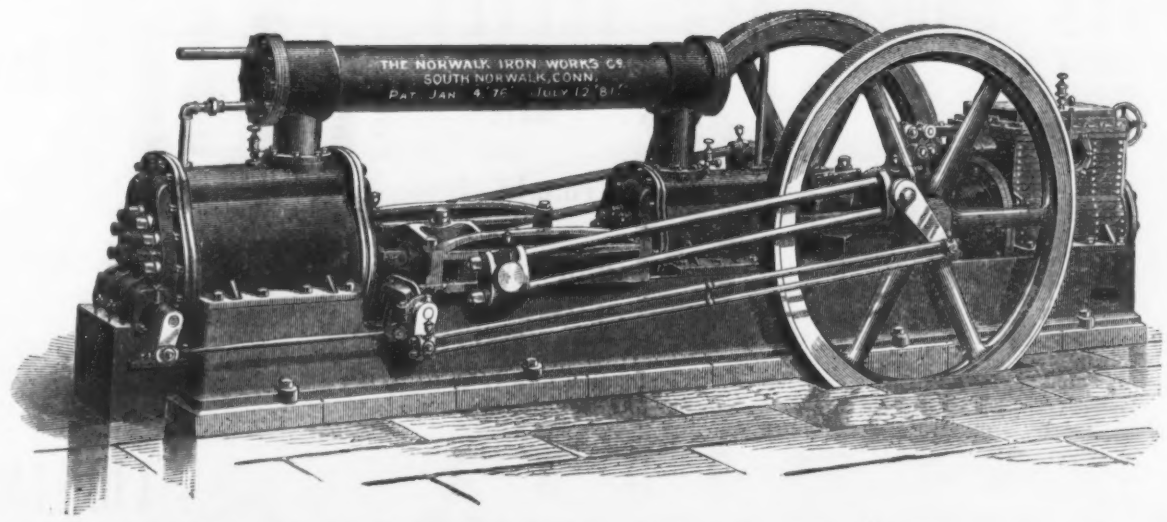

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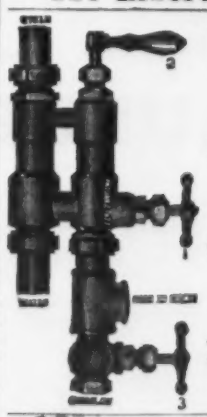

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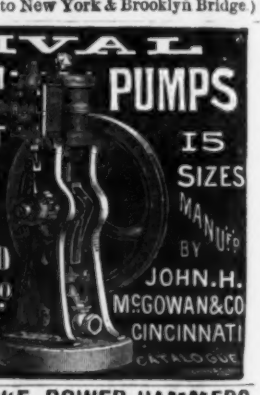

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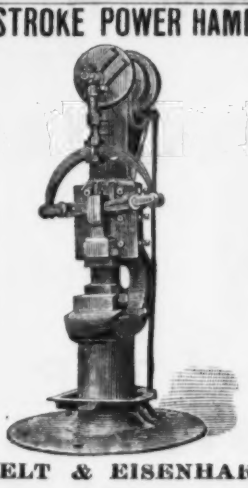

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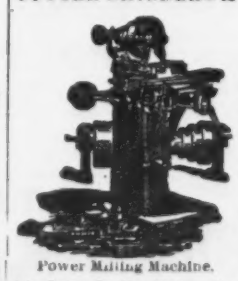

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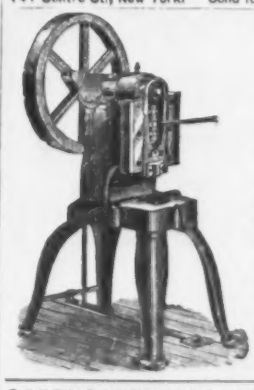

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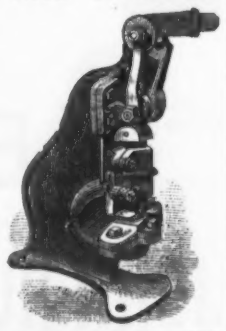

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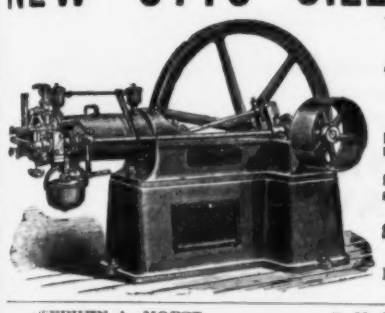

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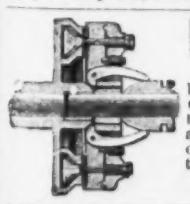

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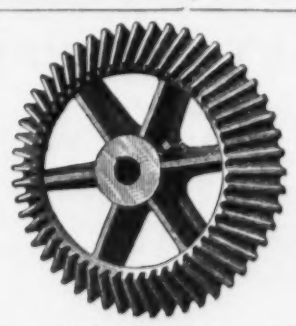

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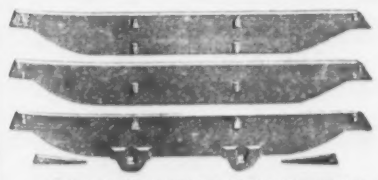

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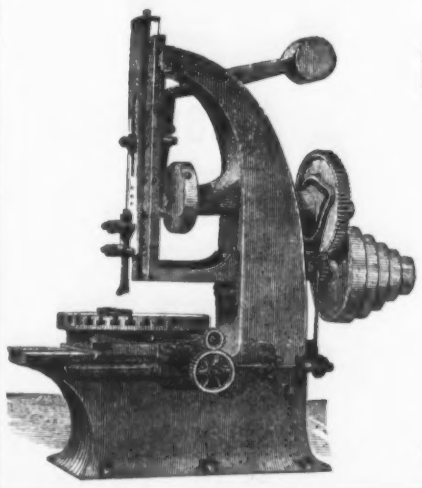

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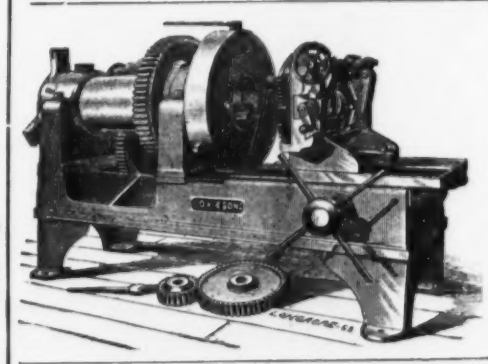

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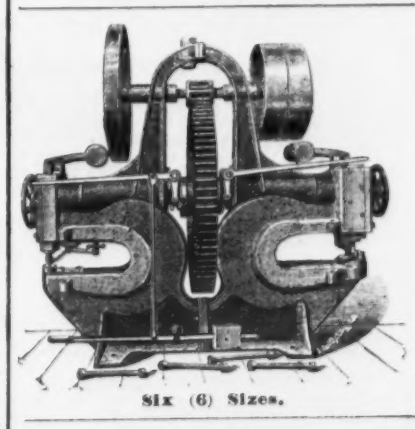

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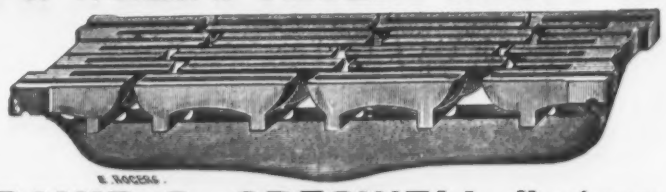

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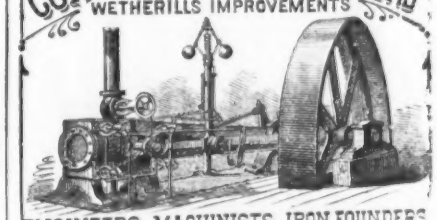

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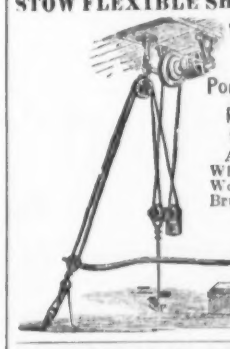

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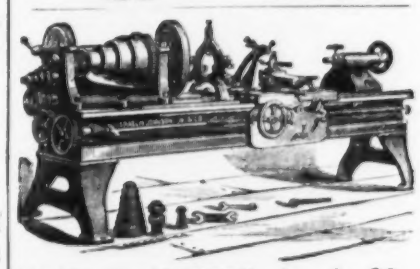

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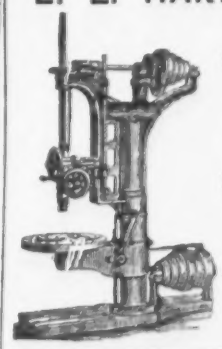

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